Chemical Week

September 18, 1954
IN TWO PARTS • PART ONE

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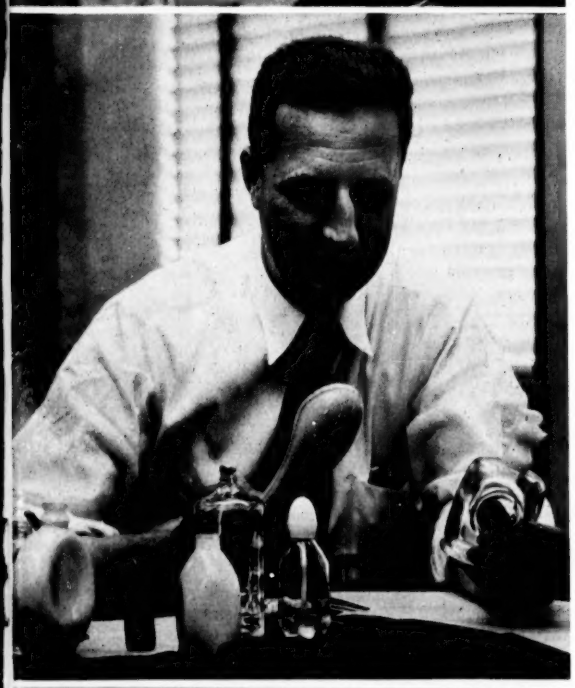

Researchers build the springboard for ion-exchange firm's diversification plunge . . . p. 16

Research takes money, but budgets need selling; here's how directors close the sale . . . . . p. 42

Wheaton's Marks: His "see-through" aerosol hits full stride, capitalizes on glamor . . . p. 59

Sales force steps outside its own thicket for unimpeded view of problems . . . . . p. 72

Here's the ringside report on Shawinigan's bout with electrolytic titanium . . . . . p. 86

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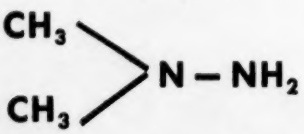

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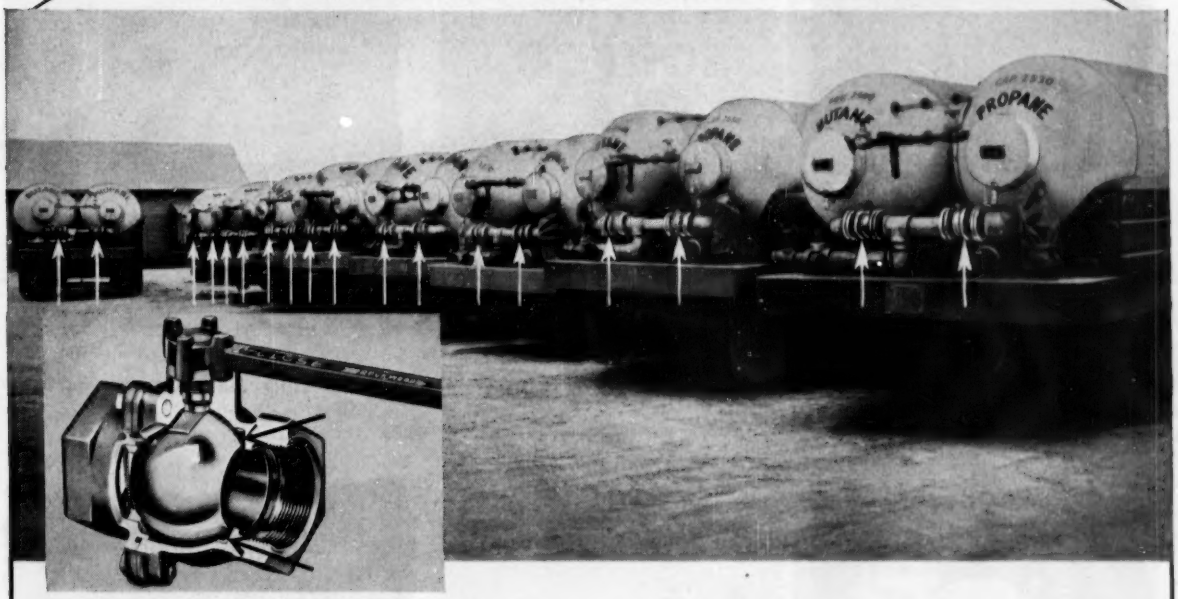
CONSTANT PROBLEM for transporters of LP Gases is keeping them constantly contained. Leakproof valves—made that way by ball seats molded of CHEMIGUM reinforced with PLIOLITE S-6B—have proved an effective answer. Photos courtesy of International Packings Corporation, Bristol, N. H., and Rockwood Sprinkler Company, Worcester, Mass.



How to make a leakproof ball valve to handle not only gases, but a wide variety of fluids and suspensions, was a tougher job than it sounds. The trick was to find a ball seat that would give a snug fit, without binding, and would stay that way, despite continual exposure and use.

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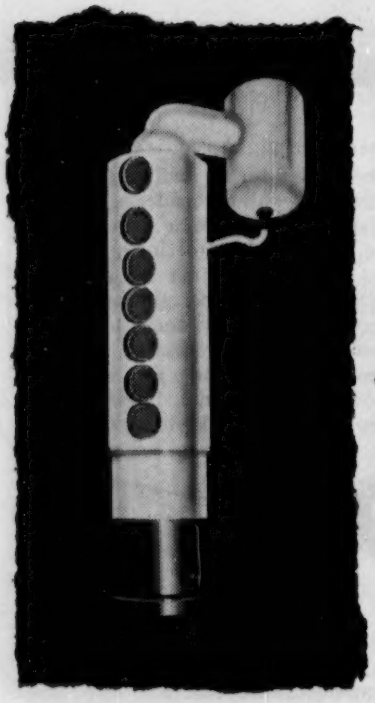

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Chemical Week

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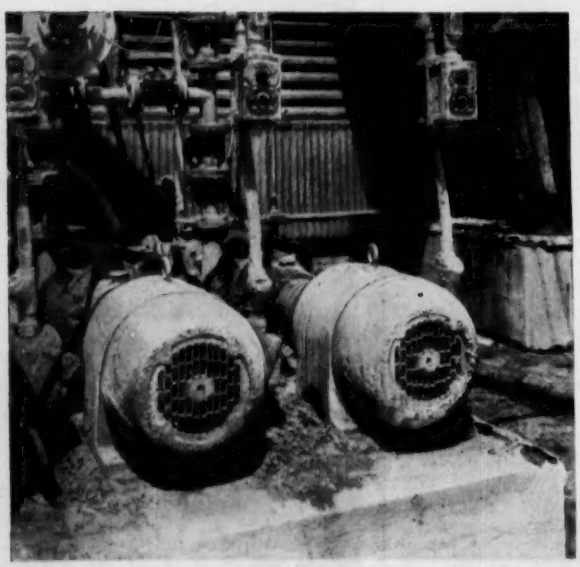
ADVICE: Replace switches and fuses with compact G-E switchgear designed with adequate interrupting capacity. Place the equipment in ventilated room to combat corrosion.

RESULT: Reliable primary power service from main substation. Corrosion problems minimized. Pre-assembly of this metal-clad switchgear at factory cut installation time.

G.E. helps convert wartime plant



ADVICE: Replace open motors in corrosive areas with G-E totally enclosed, fan-cooled, corrosive resistant Tri-Clad* motors. **RESULT:** G-E motors, such as these driving recirculating pumps, last longer, require less maintenance.

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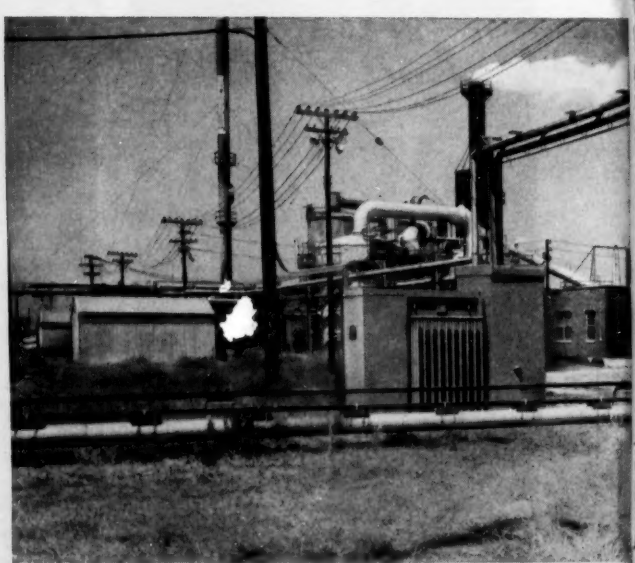
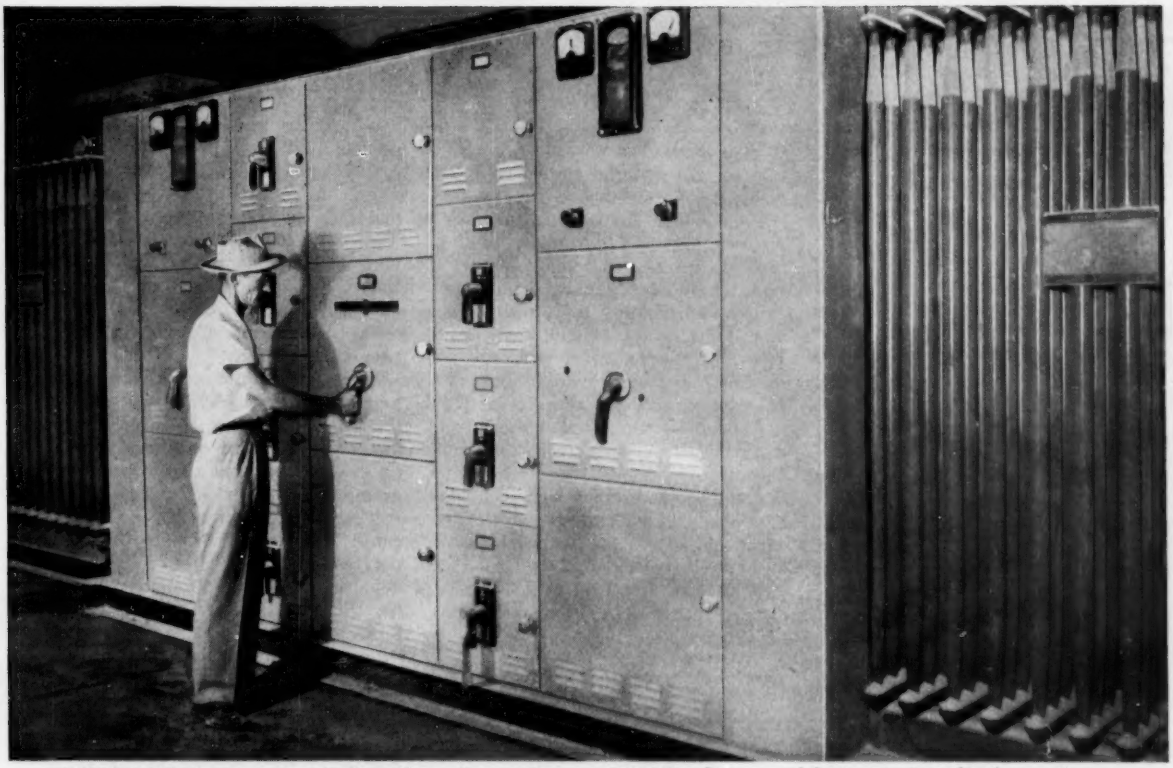


ADVICE: Place this 500-kva load-center substation near work load which is remote and in less corrosive atmosphere. **RESULT:** Reliable power supply, fewer power lines from primary station, selective fault isolation of secondary circuits.



ADVICE: Replace open pole lines for primary distribution with armored cable. Install G-E double-ended load-center unit substation in ventilated room in center of load area.

RESULT: Fewer and better protected primary lines. Selective tripping of load-center circuit breakers limits secondary power outages to faulty lines. Additional units may be added in the future.

into efficient fertilizer producer

Step-by-step installation of G-E electrical system keeps production smooth at ex-superphosphate plant

A large chemical company operates a superphosphate plant built during World War II, which has been converted to the manufacture of a high-grade fertilizer. The plant's electrical equipment needed to be replaced—and without interrupting production.

General Electric engineers—called in on the problem—made an extensive plant survey and recommended a step-by-step electrical modernization program. The program as adopted combined latest techniques and modern equipment to effectively combat the extreme corrosion caused by sulphuric acid, phosphoric dust, and other chemicals.

In succession, a compact G-E primary substation was installed in a ventilated room—vulnerable power lines were replaced with G-E armored cable—G-E unit substations were located near load centers to cut power losses—and open motors were replaced by G-E totally enclosed motors designed for chemical service. Result: the company reports complete satisfaction with the system.

Whether you plan to build, expand, or modernize a chemical plant, you too can profit by the services of G-E specialists in application and field engineering. These and other specialized engineering services are available to you through your local G-E Apparatus Sales representative. Call him early in your planning stage. General Electric Company, Schenectady 5, N. Y.

662-46

Engineered Electrical Systems for the Chemical Industry

GENERAL ELECTRIC

OPINION . . . . . .

Datum Ditty

TO THE EDITOR: Fact is, facts are, No trouble so far. Datum is, data are—Trouble, trouble everywhar!

If datum-data you entangle, Do not try yourself to strangle, The answer's simple, nothing to it, Facts for data substitute!

FRED J. L. MILLER
Trail, Canada

Often Overlooked

TO THE EDITOR: We really enjoyed the comments made by Frank LaQue in your Aug. 21 issue. . . . We have often felt that the role and importance of the anticorrosion engineer in plant economics is too often overlooked by management . . .

V. J. CALISE
Manager
Research and Development
Garver Water Conditioning Co.
New York

Erroneous Christening

TO THE EDITOR: When Wilhelm J. Kroll left his native Luxembourg and came to this country to become an American citizen he anglicized his name to "William."

Dr. Kroll is a perfect gentleman, and I am sure that if you had only notified him that you preferred to call him "Alfred," he would have gladly taken that name. Since you failed to do so, however, you can hardly blame him for winning worldwide respect and acclaim under his own name (*CW, Sept. 4, p. 62*).

In the same issue you indicate that better than 99% boron is available. There is a great difference between claiming such material and actually commercially producing boron that analyzes better than 99%.

JOSEPH SCHULEIN
Chemical Engineer
Corvallis, Ore.

Goad to Dissemination

TO THE EDITOR: Your Sept. 4 issue contained an excellent discussion of the present and future of boron and its compounds. The last page emphasized classified government research as the unavailable and unknown quantity.

True indeed, yet there is a spigot to this brimming pot of knowledge, and when it is turned on what pours out becomes an available and known quantity. At OTS we make every effort to give the widest possible dissemination to this material through our PB collection of declassified reports.

Your article has stimulated us into preparing one of our many bibliographies, this one containing some 150 reports on boron and its compounds. We shall be happy to furnish copies of this list to any of your readers for 10¢. The reports cover not only declassified federal research but also enemy technology of World War II.

Concerning the classified documents . . . whether on boron or other chemicals, if any of your readers feel that certain classified reports of which they have knowledge should be declassified as an aid either to themselves or to other industry segments, we shall be glad to hear from them. The public also can help in getting documents declassified.

JAMES KANEGIS
Chief, Chemical Section
Dept. of Commerce
Office of Technical Services
Washington 25, D.C.

Fun with Figures

TO THE EDITOR: Over the past several months I have read, in your excellent publication as well as in others from the U. S., discussions of the tariff question—a question in which we of the United Kingdom take a considerable interest.

What particularly strikes me is that many American writers handle statistics very loosely. Let me refer to an editorial that appeared some time ago in a New York newspaper. Titled "British Tariffs 20% over U. S.," it purports to show that United Kingdom tariffs are six times as high (not 20% higher, as the title misleads one to believe) as those of the United States. It says that total customs collected, as a percentage of total value of imports in the fiscal year 1951-52, were 25.6% in the U.K., and 4.9% for the U.S.

It is not made clear, however, that tariffs are imposed for two reasons: to raise revenue and to afford protection to domestic producers. The U.K. chooses to raise revenue by levying a heavy duty on tobacco, which is not produced in the U.K. This tax alone accounts for some 60% of the total duties collected during the year in question. Ignore this, and a similar duty on oil, and the ratio for the two countries is about the same.

Even so, the ratio is essentially meaningless, for it is a weighted average and as such obscures the significant features in the problem. The low U. S. ratio is primarily determined by the large value of raw materials that are imported duty-free. The very lowness of the ratio, in view of the high rates (higher than the U. K. maximum) charged on many products, attests to the effectiveness of these rates in restricting competing imports.

This 4.9% ratio could be made lower still, either by an over-all reduction of rates or by even higher rates on competing products so that they would be even more completely excluded than they are at present.

Therefore the ratio has no significance, either in relation to the comparative height of tariffs in different countries or for determining whether the U. S. tariff is just. The figures certainly provide no justification for the ridiculous conclusions drawn in the editorial.

Nevertheless, this ratio is widely quoted in the U. S., and the conclusions drawn from it are nearly always fallacious. The arguments of those favoring international trade must not be dismissed by such superficial and deliberately misleading manipulation of statistics.

GEORGE A. WOODE
Newcastle-on-Tyne
England

Still a Shortage

TO THE EDITOR: . . . My boss also reads your magazine so don't print my name . . . but it seems to me that on many occasions in CW someone is proving that there is a shortage of technical manpower. Since I consider myself underrated at my present position—I hold a degree in chemical engineering but I'm doing lab bench work—I decided to take my own personal poll of this city and environs. (I might add that I have three years of industrial experience, which should serve as an opening wedge, at least.)

Accordingly, I sent a form letter to 31 chemical plants—among which were several leading companies. I only received 9 answers and only 4 of these contained application blanks.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.
Address all correspondence to: W. A. Jordan, Chemical Week, 330 W. 42nd St., New York 36, N. Y.

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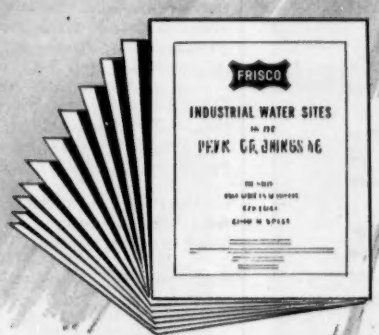
Industries whose water requirements are exceptionally large will find vital information in a new series of water studies now in preparation by the Frisco Railway. The studies cover industrial sites 50 to 3,000 acres in size, and water capacities from *10 million gallons daily* to as high as *37 billion gallons daily*. Industrial manufacturers planning a new plant or seeking to relocate near abundant water sources will find these studies invaluable.



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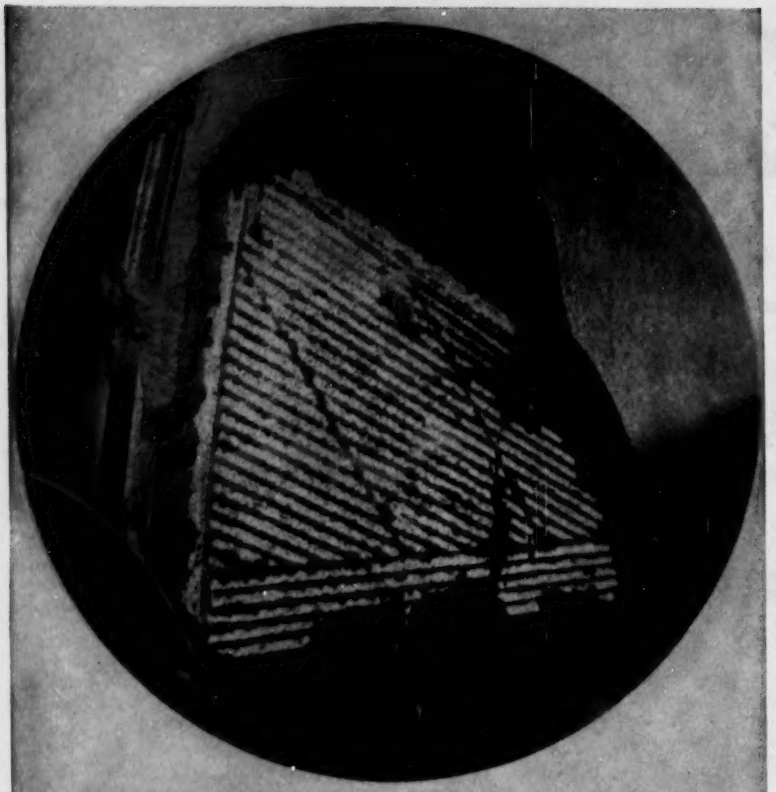

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You Can't Beat An Eimco

OPINION . . . . . .

The 5 with no application blanks said "No" outright. After 8 weeks I have yet to hear from a number of companies—including several of those to whom I forwarded filled-in application blanks . . .

Does this mean the manpower shortage is in the $250 to $350 month bracket? Does this mean I shouldn't have decided to do lab bench work to build up a background of chemical knowledge that would aid in solving production problems? Does a man have to put in 10 years of bench work before he can get into engineering?

Where does all this information about technical manpower shortage come from? I'm confused. . . .

NAME WITHHELD

All CW's reports on the manpower situation have been carefully checked and documented, conservatively and cautiously written. Isolated exceptions don't disprove our assessment of the over-all situation.—ED.

DATES AHEAD

Chemical Market Research Assn., fall resort meeting, Equinox House, Manchester, Vt., Sept. 20-21.

American Institute of Chemical Engineers-Instrument Society of America symposium on Materials Handling Instrumentation, Convention Hall, Philadelphia, Sept. 23.

Drug Chemical and Allied Trades Section, N.Y. Board of Trade, annual meeting, Pocono Manor Inn, Pocono Manor Pa., Sept. 23-25.

Commercial Chemical Development Assn., annual meeting, Bedford Springs hotel, Bedford Springs, Pa., Oct. 7-8.

American Oil Chemists' Society, fall meeting, Radisson hotel, Minneapolis Oct. 11-13.

National Chemical Exposition, Chicago Coliseum, Chicago, Oct. 12-15.

National Safety Congress and Exposition, chemical section, Chicago, Oct 18-21.

Packaging Institute, annual forum Roosevelt hotel, New York, Oct. 25-27

Assn. of Consulting Chemists and Chemical Engineers, annual meeting and symposium, Belmont Plaza hotel, New York Oct. 26.

Plastics in Building Conference, sponsored by the Society of the Plastics Industry, the Manufacturing Chemists Assn., and the Building Research Advisory Board, National Academy of Sciences, Washington, D.C., Oct. 27-28

National Paint, Varnish and Lacquer Assn., annual meeting, Palmer House Chicago, Nov. 15-17.

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G.E. announces the new chemical motor . . .

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General Electric's all-new Tri/Clad '55' enclosed motor is now even better protected against corrosive moisture, fumes, and dust. It's the ideal workhorse for tough motor applications in chemical and petroleum processing—new insulation materials developed by the chemical industry help make it so!

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Add to this new insulation system a cast-iron housing, tightly sealed at all rabbet fits as well as at the conduit box and bearing housings, a stainless steel nameplate, and the efficient new jet cooling system, and you have a chemical motor that will run for years under the toughest conditions in your plant.

General Electric Tri/Clad '55' motors are now available in ratings through 10 hp. The complete line, up to 30-hp a-c motors, will be available soon. For full details contact your G-E Apparatus Sales Office or G-E Motor Supplier today. Write for Tri/Clad '55' bulletins GEA-6013—Dripproof motors, GEA-6012—Enclosed motors, GEA-6027—Gear-motors. General Electric Company, Section 648-18, Schenectady 5, New York.

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NEWSLETTER

Best sign that summer is over is the lengthening list of business and professional meetings. Magnet this week for scientists from industry as well as from government and the academic world is New York City, where the American Chemical Society is holding its fall meeting. Registrations early this week promised a big turnout.

•

A 15% drop this year in chemical capital expenditures, predicted by a CW survey (CW Newsletter, Sept. 11), is corroborated now by a joint Dept. of Commerce-Securities & Exchange Commission report. The drop-off is greater than was anticipated last spring, when McGraw-Hill's survey showed an estimated 11½% decline.

The Commerce-SEC report shows that capital spending by industry as a whole will be down only 6%, while certain segments—petroleum, paper, transportation equipment—will boost their outlays.

But don't misread this as a dark picture. It's easy now to forget what a fast-amortization certificate was for—it was to mitigate the expense of overbuilding in order to meet potential but unrealized defense needs. It's not surprising, then, that the industry is pausing for a moment in its upward climb, assimilating its recent rapid growth before taking another big bite.

•

An assessment of the upward climb confronting the industry was given this week by Clifford Furnas, well-known researcher and chancellor of the University of Buffalo. Furnas sees the world's population tripling in the next century, its energy needs increasing 10- to 100-fold.

And that's where the chemical industry comes in. Coal, oil, gas and water power will not be able to provide all the energy needed; solar energy may fill part of the gap, and nuclear energy is growing out of the "dream stage."

Furnas deplores our present lack of fundamental knowledge in the field of energy recovery and utilization. "There will come a general recognition that something should be done about it, and that the time to start is just about now."

•

Something is being done about it in Algiers. Now ready to operate on a commercial scale is a solar furnace to produce nitric acid for fertilizers. The 40-ton, 540-sq. ft. duralumin mirror generates 50 kw., temperatures of 3,000° C.

•

Technological trends in titanium production have come to light in Australian patent applications, which are publicized earlier than those of most other countries.

• Peter Spence & Sons (England) proposes an electrolytic method wherein the metal is deposited from a fused bath containing titanium dioxide and an alkali metal phosphate, borate or fluoride; or an alkali metal fluotitanate-halide mixture.

• Zinc Corp. (Australia), which wins titanium raw material from the beach sands of Queensland, has come up with still another elec-

trolytic process; and Shawinigan has applied for Australian patents on its process, details of which are already known (see p. 88).

• National Research Development Assn. (Britain) has designed a novel furnace that permits continuous operation of a thermal reduction process. Here a titanium halide (e.g., the tetrachloride) is reduced, as in the Kroll process, with an alkali or alkaline-earth metal.

•

Possible substitute of tetraethyl lead is spelled out in an Australian patent application by Hercules Powder. The compound is bis (cyclopentadienyl) iron, claimed to be less toxic than TEL.

Patent office records there reveal that Hercules filed a U. S. application last year, is now seeking Australian protection on the material as an antiknock additive for motor fuel.

•

The other side of the world is also the site of a new joint venture: Shinko-Pfaudler Co., Ltd., in Kobe, Japan. It's a chemical process equipment firm jointly owned by the Pfaudler Co. and the Kobe Steel Works, Ltd. Pfaudler looks upon Japanese industry as the chief buyer, of course, but also sees prospects among U. S. firms that want to set up plants in the Far East.

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There's U.S. cooperation in the Western Hemisphere, too. Under a two-year program sponsored by the Foreign Operations Administration, Armour Research Foundation will carry laboratory-developed processes through the pilot plant into commercial operation. Processes to be investigated—developed at the Instituto Mexicano de Investigaciones Tecnologicas (an Armour-Bank of Mexico project)—include development of henequen by-products, candelilla wax, coal briquettes to replace charcoal, and extraction of cascalote tannins.

•

Farther east, in Puerto Rico, is the site of Houdry Process Corp.'s 100th catalytic refining unit. Commonwealth Oil Refining, the licensee, is building a $24½-million refinery to process Venezuelan and Middle Eastern crudes. And, says Houdry, "it is hoped that the refinery will spark the development of subsidiary enterprises in the petrochemical and other fields."

•

How can one keep ammonium nitrate from exploding? The U.S. Coast Guard paid Arthur D. Little, among others, to find out, and this week the consulting firm came up with some answers:

• The fertilizer-grade material has exploded in ships, but never in a warehouse. That's because of a pressure factor; the reaction doesn't generate a high enough temperature to explode except under pressure.

• Spontaneous combustion of the nitrate can occur and that can lead to explosion if conditions are right.

• The researchers established limits of temperature below which spontaneous combustion will not occur, and pressure and temperature limits to eliminate the possibility of explosion. These data enabled the Coast Guard to simplify its shipping regulations.

•

"It's Your Business!" This program series title applies directly to chemical men this week, for Saturday evening this National Assn. of Manufacturers-sponsored radio show will feature Allied's Fred Emmerich and Manufacturing Chemists' Assn.'s Willam Foster.

. . . The Editors

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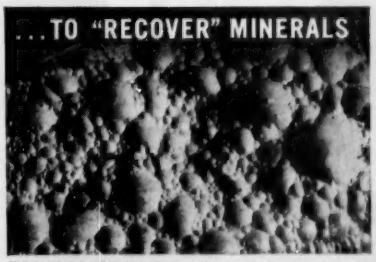

THE FLOTATION PROCESS is used extensively in industry to separate fine particles of valuable minerals, ranging from coal to gold, from less useful materials by floating to the surface and removing in a froth formed by air bubbles. Hercules flotation agents, Yarmor® Pine Oil, Rosin Amine D Acetate, and others, serve as frothers or collectors in this job.

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354-9

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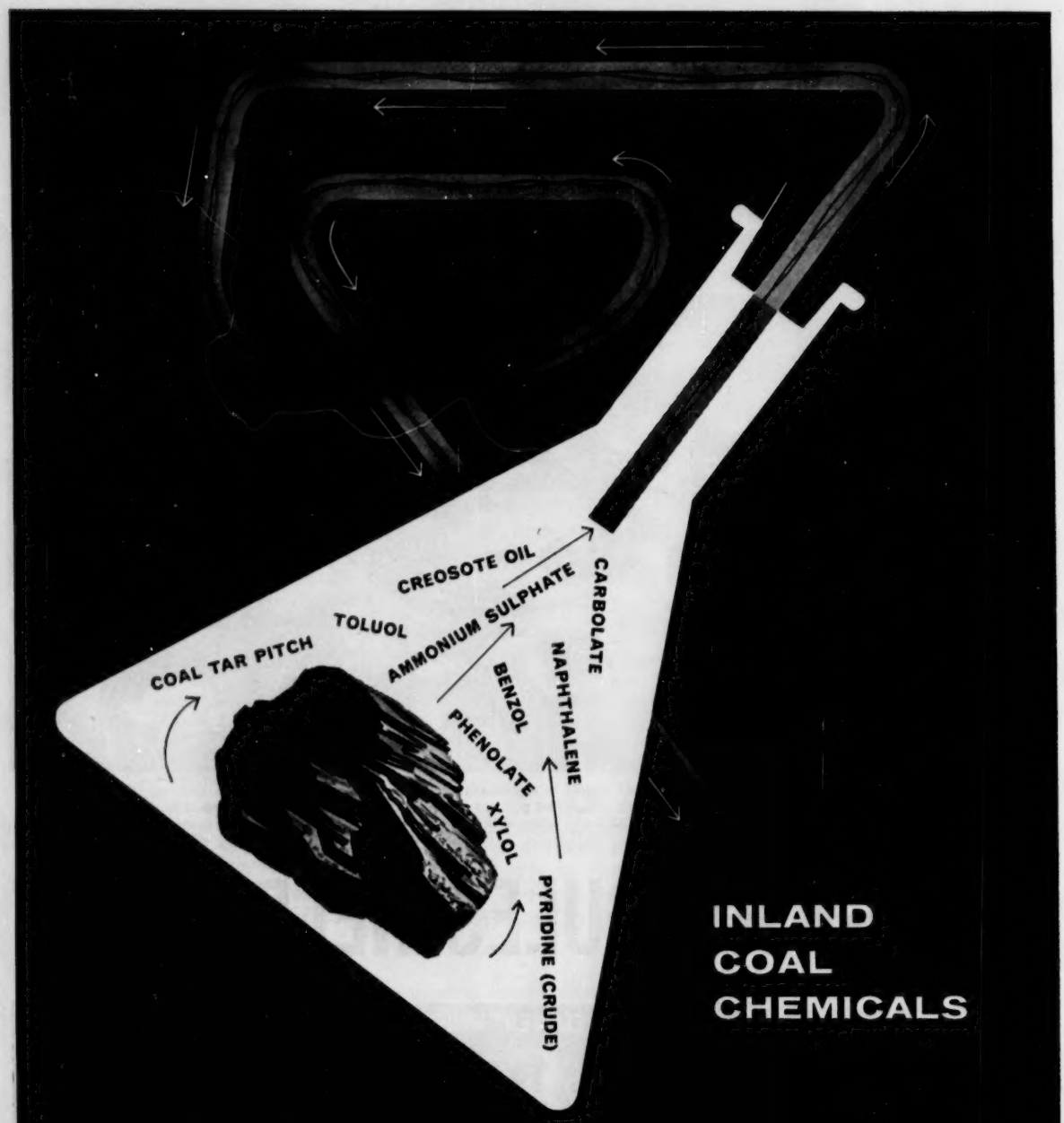

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BUSINESS & INDUSTRY. . . .

Industry's 2¢ Worth

Into the State Dept.'s public opinion hopper this week goes five full days of testimony on a topic of keen interest to many U.S. chemical companies: protective tariffs and international trade.

Upon getting the views of the chemical industry and other interested business groups, the State Dept. will start formulating the instructions to be given to the delegates who'll represent the U.S. at the ninth meeting of General Agreement on Tariffs and Trade (GATT) members starting Nov. 8 in Geneva, Switzerland.

Both protectionist and freer-trade advocates are expected to speak up at this week's hearing. Voicing chemical manufacturers' sentiments will be the Society of the Plastics Industry and the Nationwide Committee of Industry, Agriculture & Labor on Import-Export Policy, whose membership includes the Synthetic Organic Chemical Manufacturers Assn. Among the low-tariff proponents: National Council of American Importers, Inc., and the U.S. Council of the International Chamber of Commerce.

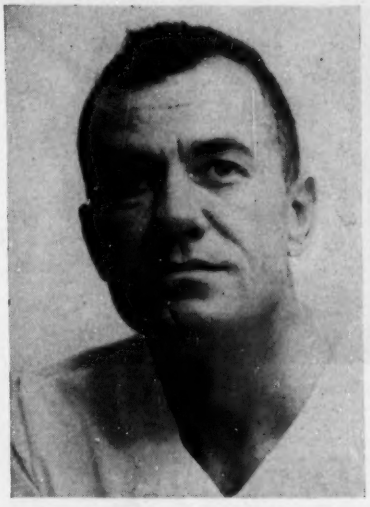
Spokesmen for both sides agree that GATT is the cinch-pin of the entire system of world trade agreements. If Congress should compel the Administration to drop U.S. membership in GATT, they say, U.S. tariffs would shoot back up to 1930 Smoot-Hawley levels in short order.

Protectionists will base their attack on GATT on the contention that it represents usurpation by the executive branch of the Congress' Constitutional power to regulate tariffs.

Against the Wall

The city council of near-bankrupt Henderson, Nev., voted unanimously last week to sue Basic Management Inc. for violating its contract with the city by failing to pay more than $100,000 in lieu of city taxes.

Action was taken after Mayor James B. French advised council members that within a period of three months the city will either be bankrupt or forced to disincorporate. Debts by the end of the year will be running over $70,000; funds are already desperately needed by treasury officials.



FRENCH: Fears Henderson will go bankrupt within three months.

Top-ranking officials of BMI (the organization set up in 1952 by Stauffer, U.S. Lime, Western Electrochemical, Titanium Metals, and Pioche Manganese) deny the charge that BMI has failed to meet its commitments to Henderson—including the promise that in addition to other outright gifts BMI will pay the city the difference between county taxes and the higher city taxes "as long as BMI remains outside city limits."

But Julian Moore, BMI manager, won't commit himself further "until a suit is actually filed against us."

Out After No. 2

Before it's had time to start firing in its $5-million civil suit against Pfizer (*see p. 28*), Ferment-Acid Corp. is leveling its legal guns against Miles Laboratories of Elkhart, Ind., the nation's No. 2 producer of citric acid.

Both Pfizer and Miles make citric via the submerged fermentation process, which Ferment-Acid asserts is an infringement on its U.S. Patent No. 2,353,771, issued 10 years ago and upheld in an interference proceeding in 1946. Pfizer stoutly denies that it's infringing on that patent; Miles Laboratories was preparing a similar denial at the week's close.

In its complaint filed in Federal District Court at New York, Ferment-Acid is asking for an injunction against further infringement; an accounting of actual damages, this amount to be tripled, or lump-sum damages in the amount of $1 million; plus court costs and attorneys' fees.

Unions in the Lab

A possible trend to unionization of chemical laboratory employees is suggested by news that laboratory assistants of Bryton Chemical Co., Trainer, Pa., voted 5 to 2 to be represented by Local 234, Oil Workers International Union (CIO). In this move, they went along with Bryton production and maintenance workers, who favored OWIU by 39 to 10. There's still a chance that the lab technicians at Witco Chemical Co. in Argo, Ill., will have OWIU Local 507 as their bargaining agent. Earlier this year, it appeared that lab workers were making up their minds to steer clear of unions.

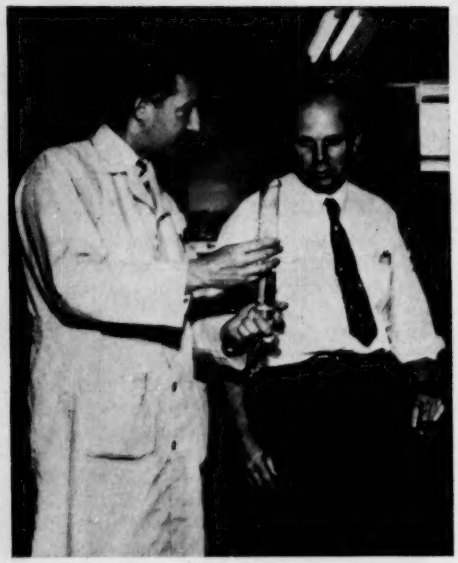
Going on the Road

One-week stands in Boston, Philadelphia and New York are tentatively planned in the Federal Trade Commission's hotly contested case against Pioneers, Inc., of Oakland, Calif., makers of the controversial battery additive AD-X2.

Hearings resumed in Washington last week with Pioneers' President Jess Ritchie taking the offensive against the National Bureau of Standards and its staff chemists who had pronounced the additive worthless. Ritchie charges that the bureau had condemned the product in 1950 but didn't actually test it until two years later. He also scored a point when his attorney—in cross-examining a bureau chemist—brought out that there had been a number of erasures on the data sheets used in the tests on AD-X2.

FTC hoped to finish the Washington phase of the hearings this week, but there's a strong possibility that the taking of evidence will be shifted to other Eastern cities later this month to complete FTC's side of the case. The commission—relying on NBS's testing—has accused Pioneers of making false and misleading claims about the additive's effect on lead storage batteries.

TARGET FOR '65: Sales should top $10 million, agree Gross and Post . . .



MORE products, pledges Dickinson (right).

Three Doors to Diversity

"In skating over thin ice, our safety is our speed." So said Ralph Waldo Emerson; and so agree officials of Chemical Process Co., the Redwood City, Calif., company that this week predicts sales will top $1.5 million this year, should reach $10 million by 1965. Main problem of a small company, they maintain, is that it's likely "to find itself inadvertently in a field really too rich for itself." Then it becomes a question of moving fast into other production fields, or sinking into the depths.

That's the lesson that Chemical Process learned the hard way back in 1943, when it found itself limping along in the ion-exchange resin field "packing costly research and development into a product . . . with very little return for our effort." Company management had almost decided to sell out (although it conceded that the ion-exchange resin field had a lot of potential with a mighty fine future) when the Navy* stepped in, encouraged it to "stay in there pitching . . . just a little longer." Chemical Process did, reorganized to provide services and specially tailored products to buck the national distribution and adept production characterizing its competition (Dow, Rohm & Haas, Permutit) until it had time to get going in the field of high polymers.

The scheme has paid off to such an extent that so far this year the company has sold 17 different resins in commercial quantities (plus modifications on many of the 17) and has acquired the reputation among resin users of being able to supply "anything the doctor orders."

"It only amounts to about 20% of our annual sales (65-70% is taken up by standard resin sales)," says technical director Niel Dickinson, "and in many ways it's much like running a drug store. Some of the items on our list move in such small quantities that they barely pay for the bread—let alone the butter. But each product has a customer attached to it, and a pleased customer is worth his weight in gold when you can't afford nationwide promotion coverage."

Vital Statistics: Production capacity at the Redwood City plant (*see cut*) stands today at 5 million lbs./year—with 35 workers employed in production, 12 in research and development, and 4 in sales. Major markets: water softening, sugar refining, deacidification of formaldehyde, glycol purification, recycling of chromic acid plating solutions, miscellaneous metal recovery and ore-treating processes (which Dickinson feels offers the greatest growth potential for ion-exchange resins today), resin therapy (for digestive and heart disorders—a field particularly fertile for specialty resins), and "a lot that disappears into the pharmaceutical industry."

Until the move into high polymers, Chemical Process held the distinction of being the only company in the country that specialized exclusively in ion-exchange resins. But President A. E. "Guy" Post and Vice-President and General Manager Paul Gross weren't satisfied. Rocked more than once by a fickle market ("Witness the big rush of civilian demand for resins in 1945-46, the dried-up market in 1948 when the expansion boom was waning"), they're convinced that "as far as resin production is concerned, we're wedded to a normal growth curve now."

Thus, Chemical Process is sold on diversification, now has three main projects high on its list of candidates for possible full-scale expansion:

- Company researchers are work-

COSMOPOLITAN OPERATION: Over 10% of

* Through the Naval Research Laboratory.

ing on polyelectrolytes for sugar clarification and ore treatment. ("We are not going into soil conditioners.")

• Chemical Process development staffers have been looking hard at catalyzed phenolic protective coatings (primarily for wood). And one of its test formulations is currently being tried (with two competing products) on Stanford University's football stadium seats.

• Formulated industrials solvents are under serious study, both as to potential market and cost of production.

Any Combination Possible: Since sales of polyester molding compounds (the company's first plunge outside resins) have doubled in the last 12 months, company executives admit they won't be hard to sell on any (or all) of the three projects, and "won't sit on the decision, once it's made."

Recent Chempro resin developments may come into their own shortly, too. Major candidates at present include: a specialty resin (S-10) for removal of trace amounts of oxygen from solutions, an A-47 precursor for selective adsorption of mineral acids in the presence of organic acids, and a modification of A-2 (which is a high-molecular-weight polyelectrolyte that can be regenerated with small excess of caustic) for lignin sulfonate recovery.

But regardless of how it moves, the next step will be a big milestone in the company that only 16 years ago occupied lab quarters in the heart of San Francisco's Skid Row. Executives will stick to expansion through retained earnings for the present, but vow that by 1965 they'll have parlayed a $5,000 capital investment into a $10-million/year business.

today's sales from Redwood City go overseas.

TRUST-BUSTER EMMERGLICK: In future, he'll side with students, firms.

Courts to Campus

Leaving the U.S. Dept. of Justice this week is Leonard Emmerglick, antitrust lawyer who prosecuted some of the biggest chemical cases in Sherman Act history.

Emmerglick, who joined the Antitrust Division at the height of the suit-filing splurge (1943-47), represented the government in such cases as:

• U.S. vs Du Pont and Imperial Chemical Industries, in which the decree required the ending of the two companies' joint ownership of subsidiaries in Canada and Latin America and the cross-licensing of certain patents. (This was considered a big victory for the government, but Emmerglick was disappointed that the decree allowed the defendant companies to insist on reciprocal licensing in their compulsory licensing negotiations.)

• U.S. vs Allied Chemical & Dye, General Aniline & Film, and other companies, which was settled with a consent decree.

• U.S. vs Aluminum Co. of America, which resulted in that company's being split off from the holding company that owned Canadian and other foreign aluminum producers.

• U.S. vs General Electric, leading to the dedication of the incandescent lamp patents to the public.

Emmerglick will become a professor of law at Georgetown University, Washington, and will start a private law practice on the side; but he'll continue to represent the government on a consulting basis in the civil suit against the major oil companies accused of cartel operations.

End of the Struggle?

No one's running the colors up yet, but the end of the road may be in sight for U.S. and European drug manufacturers plagued by a deep-seated patent wrangle with the Italian pharmaceutical industry.

Latest developments in the struggle indicate that a satisfactory compromise solution has finally been found. But because of the emotional elements of the muddle (involving Italian tradition, constitutional law, and nationalistic sympathies), it cannot be bluntly predicted that the last bend in the road has been turned.

Basic reason for all the trouble, of course, has been an irregular feature of Italian law (heritage of the Mussolini era), which does not grant patents on medicinal product processes, as do other industrial countries.

Result: U.S., British, Swiss and French firms that have surged ahead with new medicinals, especially in the antibiotic field, have been unable to protect their developments in Italy. Applications for patents on new processes have gathered dust in the Italian patent office ever since World War II, while Italian firms were using the know-how and process information to make their own pharmaceuticals.

Perhaps causing even greater immediate trouble, however, the Italian patent problem has disrupted regular business relations (including payment of royalties) with other foreign firms, and made for ill-will all around. Charges of Italian "pirating" have circled the globe, and lawsuits against Italian exporters have sprung up throughout Latin America, filed by non-Italian companies that feel they are the originators of the products the Italians are selling.

What Can Be Done? One of the promising new developments that may solve the problem really isn't official yet. But industry and government officials in on negotiations with the Italian government say that sometime this month the Italian board of patent appeals will validate about 500 foreign patent applications that have been on file as far back as 1946.

Reliable sources also indicate that a serious attempt to "legislate" out of the difficult situation is scheduled for the next session of the Italian parliament and that hope is running high that "at last something will be done."

Anticipating action, attorneys representing leading U.S. pharmaceutical companies met in Washington a few weeks ago to work up an "unofficial" position on the technical questions that may become involved in any redraft of the current patent law.

Two factors favor compromise leg-

islation over redraft, however. First, because of a quirk in the Italian patent law, Italian firms conceivably would be liable for millions of dollars of damages for infringement, covering periods of time back to the end of World War II. This rather harsh possibility would be avoided by a new law. Moreover, past infringements of patents pending up to Jan. 1, '55, would be written off entirely, liability running only on infringements that continue beyond this date.

And second, the Italian industry itself has undergone changes since the early postwar days. Many observers feel that the opposition to patent protection for processes was a "transitional" one that many large firms have now outgrown. It is true also that the present situation works to the disadvantage of Italian research.

Many Italian firms now active in their own research programs, would be the immediate beneficiaries of patent protection. And it's only natural that leading firms want protection for their investments in research and a chance to cash in on their discoveries as much as U.S. and European companies do.

Finally, a new law would settle much of the dust surrounding present licensing arrangements, whereby some Italian firms have satisfactory license agreements, only to suffer at the hands of others who do not.

It adds up to a decidedly favorable climate for change. Not only U.S. companies are pressuring for reform, but also Italian chemical concerns are now turning on their own heat—throwing their weight into a fight for patent laws "at least compatible" with those of the U.S. and Great Britain.

EXPANSION . . .

Phosphoric Acid: Virginia-Carolina Chemical Corp.'s phosphoric acid, sodium polyphosphate plant at Fernald, O., is now in full production.

•

Formaldehyde: Reichhold Chemicals, Inc. will build a plant at Charlotte, N.C., to produce 25 million lbs. of formaldehyde annually. Scheduled for construction adjacent to the company's existing buildings on Pineville Rd., the plant will be the second formaldehyde to be built in the South —the first being Reichhold's plant in Tuscaloosa, Ala.

•

Cement: International Cement Corp. (a subsidiary of C. F. McDougall Associates, Dallas) will build a $5-million cement plant near Chilliwack, B.C. Production is expected by next May; geologists in the area assert that there's enough mineral deposit in the immediate vicinity to keep the plant in full-scale production for more than 200 (sic) years.

•

Polyvinyl Chloride: Seiberling Rubber Co.'s new rigid plastic plant at Newcomerstown, O., will be in production before the end of the month.

COMPANIES . . . .

Eldon Manufacturing Co., Los Angeles, plastic molding firm, has acquired Econ-Fibre Glass Manufacturing Co., Los Angeles, through a stock transfer. Econ manufactures laminates and reinforced moldings.

•

International Cellucotton Products Co. has signed a purchase contract for nine acres of land in Niles, Ill., to build new executive office buildings. Contract is contingent on the land being rezoned; but the purchase price has not been revealed. When and if arrangements are completed, only office, management personnel will be affected. Manufacturing facilities will be continued at Neenah, Wis., Niagara Falls, N.Y., and Memphis, Tenn.

•

Pan-American Uranium Corp. officials say that a "large" uranium strike has been made on company property in the Red Canyon area of Utah. According to the report, Pan-American Uranium geologists have found a "large body of shinarump with high uranium content, running one mile wide, up to 30 ft. deep."

•

Both sales and net earnings of Spencer Chemical Co. reached record highs in the fiscal year ending June 30. Sales pushed up 10%—from $30.8 million in 1953 to $34.1 million this year; net earnings rose over 13%—from $4.6 million to $5.2 million.

WIDE WORLD

For Peaceful Purposes

WHEN EISENHOWER waved a magic neutron wand in a Denver, Colo., television studio last week and started a robot power shovel breaking ground for the nation's first full-scale atomic plant for peaceful purposes near Shippingport, Pa., 1,300 miles away, he launched what well may be a new age for the chemical process industries. Charged with construction work: the Duquesne Light Co., which will build the electric generating portion of the plant, and Westinghouse, which will handle the nuclear reactor portion.

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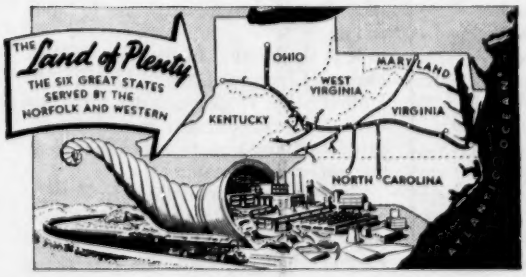

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EMPLOYERS GET BETTER BREAK

(NLRB decisions in chemical labor disputes, Jan. 1, 1951, to Aug. 1, 1954)

	(Democratic administration) 1951	1952	(Republican administration) 1953	1954*
Decisions favorable to labor unions	3	4	4	2
Decisions favorable to management	0	2	4	3
Decisions partly favorable to both sides	1	1	0	2

*First seven months only.

WIDE WORLD

PREDECESSOR HERZOG: Under his regime, a .727 batting average for unions.

Labor Board's Lighter Touch

That the new members and new policies of the National Labor Relations Board have already made themselves felt in the chemical process industries is demonstrated this week in a Chemical Week breakdown of NLRB decisions in chemical labor disputes. This analysis—showing that unions and management have split those decisions on a nearly 50-50 basis since the Republican administration went into office—is particularly significant and timely in view of the fact that chemical labor unions have taken up the plaint that NLRB is becoming more and more "promanagement."

Chemical Cases, Too: The chemical unions and other AFL and CIO affiliates have been riled by what they see as an "antilabor" pattern of NLRB decisions in various labor-management disputes—including a number of test cases emanating from the chemical industry. Previous NLRB policies are being overhauled or junked by such moves as last month's decision to limit the right to strike by requiring in certain instances an extra "cooling off" period beyond the 60 days specified in the Taft-Hartley Act.

Other recent decisions that have had the union leaders fuming:

- A change in NLRB standards cutting the board's jurisdiction to companies doing a larger dollar volume of interstate commerce than heretofore. Reason for this change: the huge backlog of cases pending before the agency. Board members say that many of the small business cases are better handled by the states; union leaders insist that few states have adequate legal safeguards for workers and their unions.
- A new NLRB ruling that interrogation of employees as to their membership and activities in unions is not necessarily unlawful. Previously, the board had held that any such questioning constituted an unfair labor practice.
- The recent decision in the case of Detergents, Inc. vs United Gas Coke & Chemical Workers (CIO) permitting employers to use company time and property for speeches to employees and denying such use to labor unions.
- A declaration in the case of Wyandotte Chemical Co. and District 50, United Mine Workers, that a threat to strike, slowdowns, and economic reprisals against nonunion sympathizers are unfair labor practices.

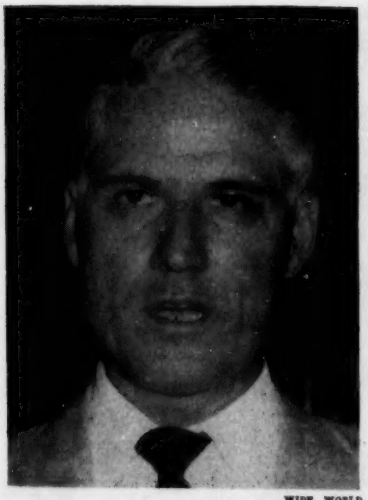
Unions Not Blackballed: In chemical cases, the NLRB under the leadership of Republican Chairman Guy Farmer has divided its decisions

CRAFTS PASS A CRISIS

(NLRB decisions in chemical process industries' representation cases, Jan. 1, 1951, to Aug. 1, 1954)

	1951	1952	1953	1954*
3 or more separate craft units permitted	2	3	1	1
2 separate craft units permitted	0	1	0	2
1 separate craft unit permitted	1	2	2	2
No separate craft units permitted	1	3	0	3
Professional and technical employees excluded from bargaining unit	4	0	2	1

* First seven months only.



WIDE WORLD

INCUMBENT FARMER: Since GOP victory, a .533 record for management.

nearly 50-50, awarding six decisions to unions, seven to management, as shown in the table at the top of p. 20. During the two previous years under Democratic Chairman Paul Herzog, the board gave seven decisions to unions, two to chemical employers.

This would seem to rebut any claims by unions that the new labor board has been altogether against them. In fact, two of the latest important pro-union decisions came in chemical cases:

- Trade unions are permitted to distribute union literature on a company-owned parking lot (Monsanto Chemical and International Assn. of Machinists, Soda Springs, Idaho).
- A plant election still will be set aside if the employer makes a speech to employees within 24 hours preceding the election (Texas City Chemicals and Oil Workers International Union [CIO]).

Upheld in Courts: Unions also might take comfort from the fact that a number of recent court decisions have upheld previous NLRB rulings that were favorable to labor. For example, in the Sharples Chemical case, a U.S. Court of Appeals backed up the board in saying that the employer should withdraw recognition from company-sponsored employee committees and cease interfering in Gas-Coke's organizing efforts.

On one point, NLRB policy has drawn fire from both chemical management and the principal unions in the industry. The board has been increasingly sympathetic to the carving out of small "craft units" from over-all collective bargaining groups.

For better or for worse, current NLRB policy will mean less frequent and less sweeping governmental action in chemical labor-management affairs, could discourage labor people from taking their troubles to NLRB.

SOME WIN, SOME LOSE

(How various labor unions have fared in NLRB's chemical cases, Jan. 1, 1951, to Aug. 1, 1954)

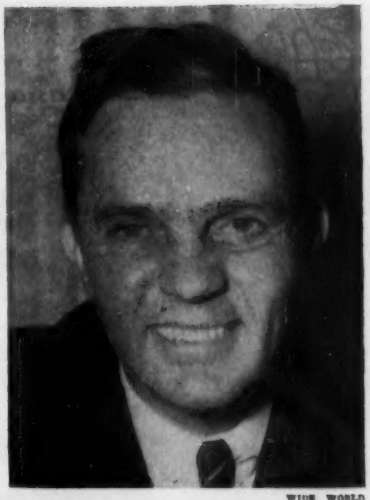
	Cases Won	Cases Lost	Cases Partly Won, Partly Lost
United Gas, Coke & Chemical Workers (CIO)	8	2	2
Oil Workers International Union (CIO)	3	1	0
International Chemical Workers Union (AFL)	0	2	1
District 50, United Mine Workers (Ind.)	0	1	0
Other unions	2	3	1

Early Opposition

Before Philadelphia's new water fluoridation program has a chance to get under way this month (*CW, Sept 11, p. 23*), it faces an injunction filed by four angry citizens attempting to restrain the city's administration from carrying out the plan. Named as defendants: Mayor Joseph S. Clark, Jr., Dr. Norman R. Ingraham, acting city health commissioner, Samuel S. Baxter, city water commissioner. Such opposition is not new to profluoridation forces, encouraged by recent favorable decisions from both the Ohio court of appeals and Oklahoma's state supreme court.

Charging that the introduction of fluoride into city water does not serve any sanitary purpose aiding public health or improving water quality, the Philadelphia complaint states that if fluoride is added "it denies . . . the right to pure and wholesome water and . . . constitutes an alleged hygienic treatment to the . . . teeth in direct violation of the Commonwealth's regulations and laws in the practice of dental hygienists." It also contends that a noxious effect is produced when the chemical is added.

Another outburst comes from H. F. May, chairman of Philadelphia's Citizens Committee Against Fluoridation, who refers to evidence from research scientists of harm done in other parts of the country—Akron, O., for example, where use was curtailed, May says, after residents reported serious skin diseases. Placing the new suit on legal and constitutional grounds, he suggests the chemical effect on the body is unpredictable, should not be forced on citizens without giving it a fair trial.



WIDE WORLD

MAYOR CLARK: On the eve of fluoridation, an injunction.

A resident of Cleveland who brought suit has threatened to appeal to the state supreme court and even the U.S. Supreme Court, if necessary. Cleveland's board of control has agreed to continue marking time on the water fluoridation move until the state supreme court decides whether to accept or reject the suit. If that court refuses to hear the suit, then the city is prepared to move immediately to treat the water, whether the case is carried to the U.S. Supreme Court or not. If the state supreme court decides to hear the case, then the city will await that court's verdict.

When Tulsa, Oklahoma, opponents of fluoridation asked the state supreme court to nullify that law, the court ruled that the state legislature was within its rights to authorize cities to fluoridate their water supplies.

Mayor Clark approved Philadelphia's ordinance as far back as Dec. 5, '51, but, plagued by technical and manpower problems, Commissioner Baxter was scheduled to begin adding fluosilicates in tiny amounts only late this month. The injunction comes as a new cry, but with a familiar ring.

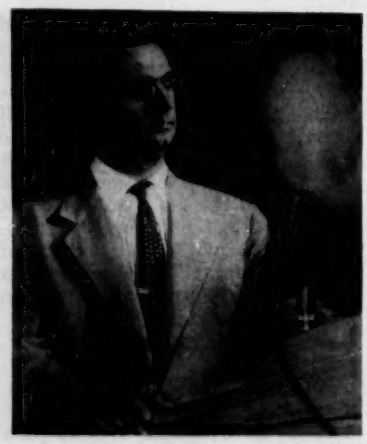
So far, then, the first two principal test cases on water fluoridation have been decided on the pro side of the score card. The Philadelphia contest provides still another forum in which to argue the legal principles, makes it still more likely that—sooner or later—the U.S. Supreme Court will be asked to rule on the question.

CONTROL CENTER: Regulates lectern clock (see lower cut left), comic cartoons, smoke puffs.

No Chance to Filibuster

Chairmen of unbusinesslike businessmen's conventions, where long-winded speakers seem to thrill to their own voices, might well take a few pointers from Standard Oil Development Co. which has devised a scheme to keep speaker's within the limits of their allotted speaking time.

Solid proof of the efficacy of Standard's scheme: in a period of time adding up to only four days of meetings, company chemists twice a year listen to 50-55 formal presentations plus both organized and spontaneous discussion sessions, see some 500 lantern slides and several movies— and the whole program barely exceeds its schedule by even one minute. Even the final speaker gets that rarest of all breaks—the same time to divest himself as those who have preceded him to the platform.



TRICKY LECTERN: Makes time fly faster than usual, contains hidden smoke pellets to cut off long-winded speakers.

How, one might ask, is Standard's system accomplished?

The answer's simple; speakers overextending themselves are treated to a regular barrage of warning lights, belly laughs (as comical cartoons suddenly show up the movie screen) and bursts of smoke. Not even the most intrepid elocutionist is able to withstand the onslaught.

Heart of the Plan: Controlling the system is an elaborate, electrically synchronized board, from which the meeting's secretary can regulate time, warning lights, etc. For known-to-be long-winded speakers: there's even a regulator for the rostrum clock, whereby (unknown to the speaker) time can be made to run faster.

Meanwhile, 65 microphones are placed among the audience—microphones that are controlled by the secretary, must be grasped by the speaker to become operative.

There aren't any interruptions from home offices: messages summoning delegates are silently flashed on the wall, cut distraction to a minimum.

Man most responsible for Standard's system of split-second coordination at meetings is spry Howard Tate, veteran company official. His philosophy on the value of lengthy speechmaking largely paraphrases that of the late Arthur Hadley of Yale. "Few souls (and fewer chemical meetings) are saved after the first 20 minutes."

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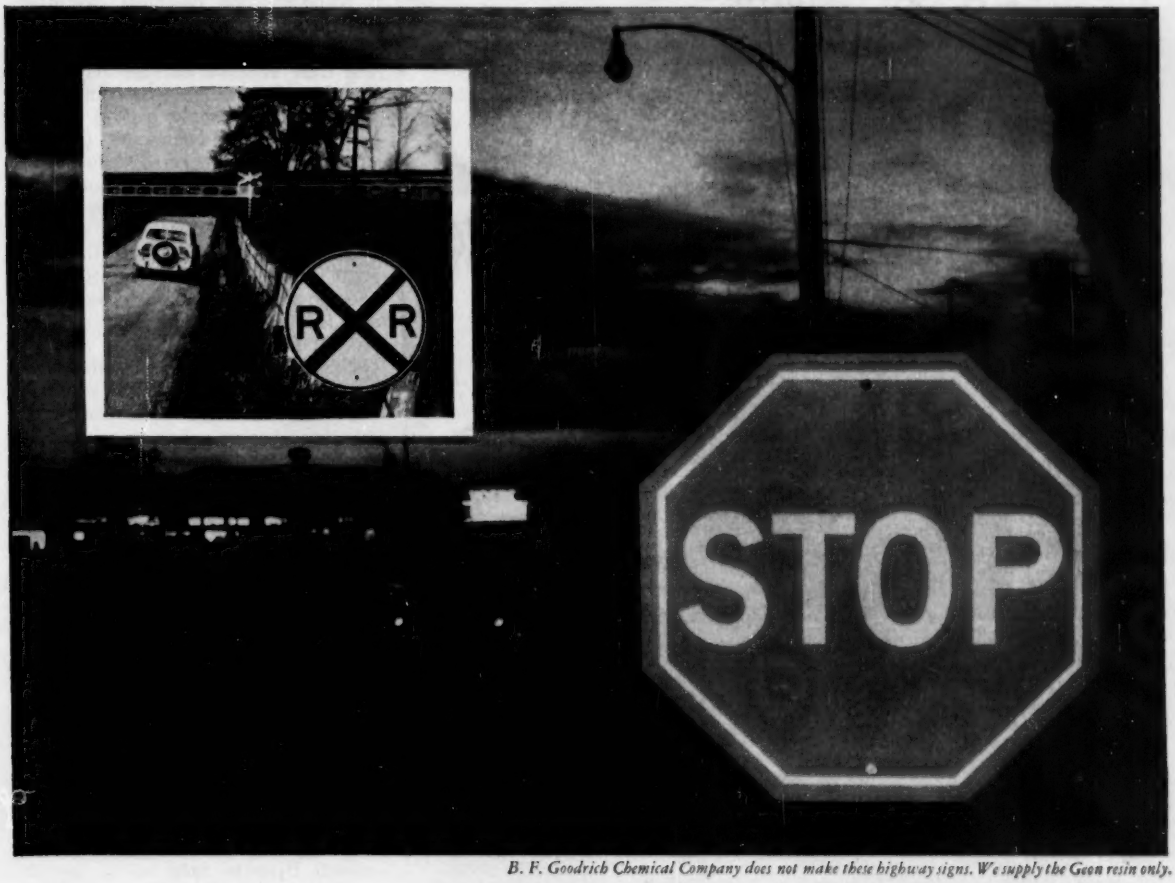

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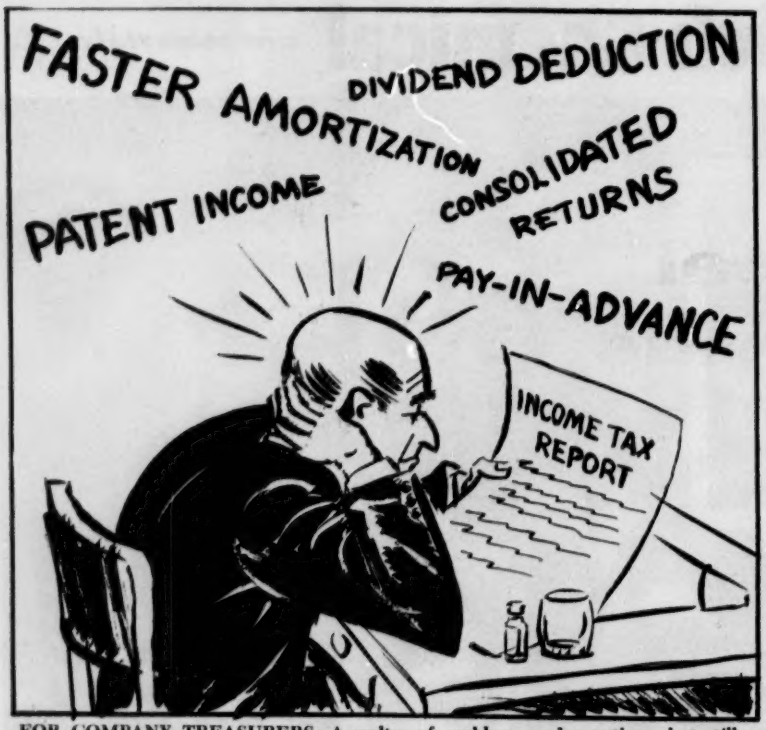

FOR COMPANY TREASURERS: A welter of problems and questions, but still a mood of . . .

Cautious Optimism

While they aren't tossing hats in the air, chemical company treasurers are reasonably content with the Administration's new deal in taxes. Where there's dissatisfaction, it's a question of degree rather than kind. Summing up reaction among treasurers polled this week by CW: recent tax revisions are a step in the right direction—but there's still a long way to go to right a host of inequities.

The major advantage most chemical companies see in the new law is the impetus it will give to expansion. "But don't look for overnight expansion," warn treasurers; "the benefits we'll reap will be the long-run kind."

The widely hailed provision for faster amortization, for example, will undoubtedly do more than anything else to stimulate capital investment. But few companies expect to feel its effects for two or three years. One hopeful treasurer regards it as only the opening wedge for further liberalization. Another, not so sanguine, says that the quick write-off is not as good as it looks, that its net effect means a company isn't permitted any more actual depreciation although it can amortize faster. All agree on one thing: it means more book work for treasurers.

Chief Benefits: The increase in dividend deductions gets a vote of qualified appreciation from the chemical industry. But management won't rest easy "until there's elimination of the principle of double taxation."

The measure for maintaining the corporate tax rate at 52% until next April is accepted stoically by most, who, like Oronite Chemical's George Parkhurst, are "sorry to see the 47% rate postponed" but concede Congressional decision was sound "in the light of the federal budget." When the tax rate does drop next year, many point out, it will be further encouragement to corporations to plow more money back into capital expenditures.

"Constructive, but it will have no effect on us," is the way most company spokesmen characterize the liberalized depletion allowances for mineral producers.

The proviso that puts on tax collectors the burden of proof that undistributed earnings are unreasonable, say treasurers, corrects a long-existing mistake. And one adds that improper surpluses wouldn't be a problem at all if dividends were tax free.

Liberalization of tax rebate by permitting a two-year carryback of losses is tabbed by everyone as a fairer method of taxation and especially beneficial to small businesses. But it won't affect high bracket income companies much, they point out.

Although one chemical executive (*CW, July 31, p. 13*) thinks the new capital gains treatment for inventors and their financial backers may be a boon to chemical process companies, most industry people believe it will benefit only small companies, (mainly pharmaceutical concerns) and individuals—since most big companies are currently paying personnel for inventions on a $1 basis.

Major Gripes: CW finds that the great majority of chemical companies, affected or not, bemoan the fact that the House-passed provision making 14% of income from foreign sources tax free did not appear in the final version of the new law. They say that (1) it would have been consistent with Eisenhower policy to encourage investment abroad, and (2) business should get tax break on foreign operations since the risk is so much greater than on internal operations.

Sole big gripe of company treasurers, however, is the change in the pay-as-you-go custom, which will eventually see corporations pay 50% of estimated tax during the third and fourth quarters of the calendar year in which the tax is incurred. Their reasons vary. One official simply does not "subscribe to the principle of paying taxes on estimated income." Another feels that the "new arrangement discriminates against big in favor of small business." A third asserts: "It will be the small companies that will be hurt —they'll have to hold on to liquid money they could formerly use for development and expansion." One disgruntled treasurer feels "the government has gone too far with a good idea" because seasonal factors in many businesses make it difficult to estimate earnings in advance.

More than a few company treasurers are openly skeptical about the faster tax amortization features of the new tax bill. Questions one West Coast board chairman: "Will certificates of necessity also be continued? Most chemical companies had hoped to shuck the administrative burden of getting certificates of necessity. Now they're not so sure . . . "

But, for the most part, chemical men are satisfied that "at last the tax wagon is rolling in the right direction." Notes one Midwest specialty manufacturer: "Most of us are grateful for any tax relief however insignificant. More important is the change of attitude on corporate taxes in Washington today. For the first time in a long time . . . someone's fighting to give a break to growth companies."

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WIDE WORLD

LOS ANGELES SMOG: When harmless chemicals combine, eyes start smarting.

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WIDE WORLD

ROTHMANN, LARSON: In pollution enforcement work, no job security.

More Push in Purity Drive

Now under vigorous attack in nearly every large city, air pollution shows signs this week of being on the road to extinction as a major industrial and civic problem in the U.S.

This week, in New York, delegates to the 126th annual meeting of the American Chemical Society are hearing 11 technical papers on progress in processes and equipment for air pollution control; and in Pittsburgh, the Air Pollution Control Assn. is broadcasting appeals to governmental officials, industrial executives, educators, civic clubs and the general public to take part in the observance of Oct. 24-30 as national "Cleaner Air Week."

And throughout the country, developments in numerous cities all point to a more serious public attitude on this matter. For chemical companies, this suggests the desirability of taking pains to demonstrate to their hometown communities an awareness of the problem and a will to overcome it.

Chemicals Criticized: Among the summer's major events in this field:

• The chemical industry, in replying to governmental criticism, reports that it's spending some $40 million/year on pollution control (including both air and stream pollution); among latest projects: installation of two catalytic incinerators, at a cost of some $275,000, at the Frankford Works of the Barrett Div., Allied Chemical & Dye Corp.; and installation of two fly ash collectors, costing about $10,000, at the Kentucky Color & Chemical Co. plant, Louisville.

• Detailed reports were issued on air pollution control programs in Detroit and Louisville, and on the chemistry of the smog situation at Los Angeles. Highlights: Detroit's Bureau of Smoke Inspection & Abatement last year received 2,876 complaints—19.8% more than in the year before—of which 19 led to convictions and fines; Louisville's Air Pollution Control District found 1,027 instances of air pollution law violations on the part of industrial firms there, began keeping day-to-day records on such pollution factors as staining properties and dirt fall; and the Stanford Research Institute relates how unusual chemical reactions among ordinarily harmless contaminants can produce "most of the undesirable characteristics of Los Angeles smog."

• In two of the nation's largest industrial centers, air pollution control directors were in trouble because of dissatisfaction with their policies. In Los Angeles, Gordon Larson was completely cleared of the anonymous charges that sparked a grand jury probe (*CW, Aug. 14, p. 5*); but in Philadelphia, S. Charles Rothmann was ousted on grounds that "inadequate progress has been made."

Various cities are approaching the air pollution bugbear in different ways. At Norfolk, Va., the Chamber of Commerce feels that in starting its air pollution control work now, it will be a matter of prevention rather than expensive correction and cures. Along the Texas Gulf Coast, considerable improvement has been noted in pollution conditions—and where improvements haven't been made, officials are taking a "tough" line on alleged violations. Harris County Attorney Burke Holman bluntly ordered Consolidated Chemical Industries to curb its emission of sulfur dioxide, and a similar directive to Best Fertilizer Co. resulted in that plant's being shut down "for an indefinite period."

One optimistic note: To Florida residents fearing that construction of an oil refinery might hurt the tourist trade, an American Petroleum Institute official declared that "All these pollution problems have been solved" and that all control features can now be incorporated in plant design.

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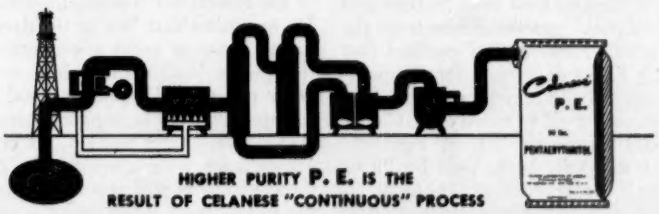

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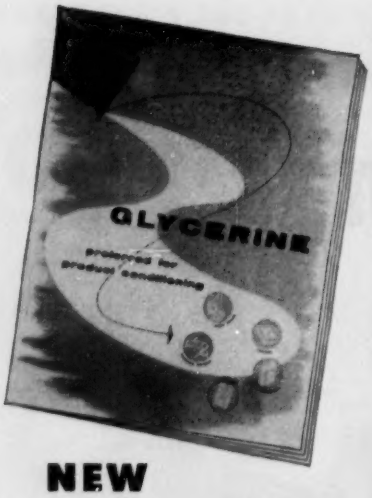

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LEGAL . . . . . .

All in a Name: Whether "TCP" is a trademark or a common abbreviation for tricresyl phosphate still has to be proved, Federal Judge Edward Weinfeld has ruled in refusing to issue a preliminary injunction against Shell Oil Co. This came in American TCP Corp.'s $3-million civil suit against Shell in U.S. District Court, New York, after American TCP had asked the court to enjoin Shell from representing that "TCP" is Shell's trademark and that this additive is available only in premium gasoline sold by Shell and its licensee. American TCP showed the judge a number of catalogs and other publications that refer to tricresyl phosphate as "TCP," but Shell reported that a search of 930 chemical reference books turned up only 80 that mentioned this compound at all, and only five—all of which were printed in Great Britain—that referred to it as "TCP." Weinfeld held that a sharp conflict exists on the basic issues.

•

How Deep is Deep? If the citric acid suit between Ferment-Acid and Pfizer (*CW, Sept. 11, p. 17*) goes to trial, it may call forth some of the most technical testimony in chemical litigation. For example, Pfizer scientists may have to explain how their "submerged fermentation" process differs from the "deep tank fermentation" method that Joseph Szucs developed for Ferment-Acid; and Szucs may be asked to take the witness stand to specify what "confidential information" from Ferment-Acid is allegedly being used by Pfizer in citric production at its plant in Groton, Conn. Pfizer, a leading citric producer since 1880, insists that it has never used the Szucs method "or any process remotely related to it."

Szucs, a graduate of the Univ. of Budapest, has pioneered in citric research on two continents. His pan method, patented in Czechoslovakia in 1924, has been used continuously in that country since 1930. In 1944, he received U.S. Pat. 2,353,771 for a deep tank process that was upheld by the Commissioner of Patents in a 1946 decision on an interference action.

•

Varied Viewpoints: A misunderstanding—to say the least—is evident in the civil damages suit pending in Federal Court at New York between Herbert Stecker (former head of Stecker Chemicals, Inc.) and Gallowhur Chemical Corp., New York.

Stecker's version is that he was induced to leave Stecker Chemicals by the argument that Gallowhur already knew how to make the slimicides that were Stecker's principal product, and by promises that he would be made Gallowhur's vice-president in charge of sales and would be paid $12,000/year. He charges that the argument was false, and that Gallowhur cut his salary and forced him to resign.

It's entirely different, the way Gallowhur relates the story. Gallowhur says that its purchase of Stecker Chemicals was part of a three-way agreement among Stecker, Gallowhur, and Metalsalts Corp., which owned 90% of Stecker Chemicals. The purchase, according to Gallowhur, was arranged because Stecker's slimicides infringed on a patent under which Gallowhur was exclusive licensee. While Stecker headed the Gallowhur sales section, says the Gallowhur counterclaim, sales dipped by more than 50%, forcing a cut in Stecker's salary.

•

Antibiotic Law Attacked: Among food and drug attorneys, opposition is building up against continuation of the Food & Drug Administration's program for certification of certain antibiotics, new drugs and coal-tar colors (*CW, July 24, p. 40*). Latest attack came before the Food, Drug & Cosmetic Div. of the American Bar Assn. during ABA's recent convention in Chicago, with lawyer Paul Gerden of the Illinois bar leveling the charges. He maintains that "we in the drug industry have as great a concern over the public health and safety as any other group, and cannot in good conscience continue to support measures that are no longer needed." If certification rules were dropped, he adds, these products still would fall under the adulteration, misbranding laws.

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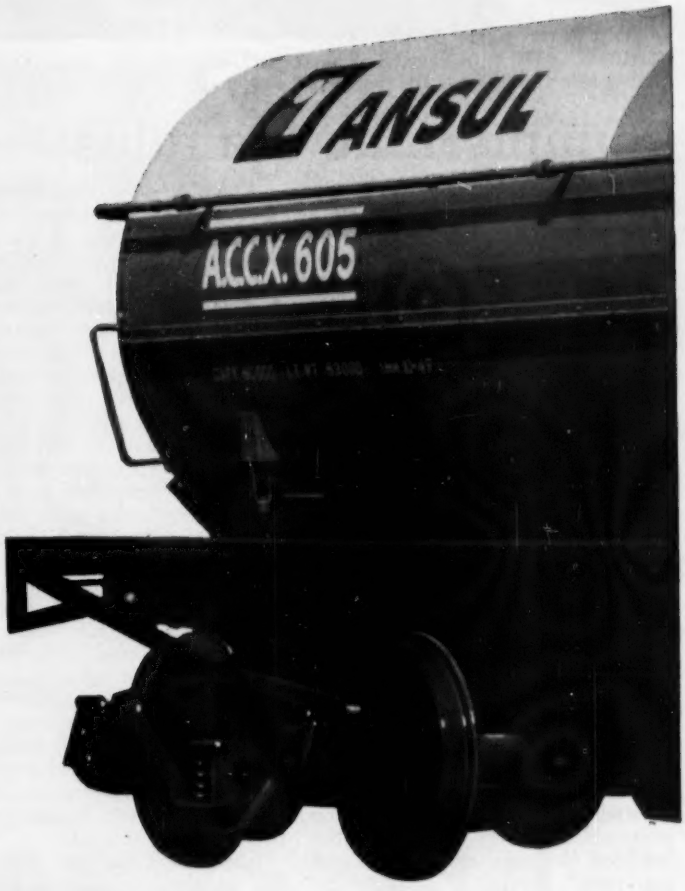

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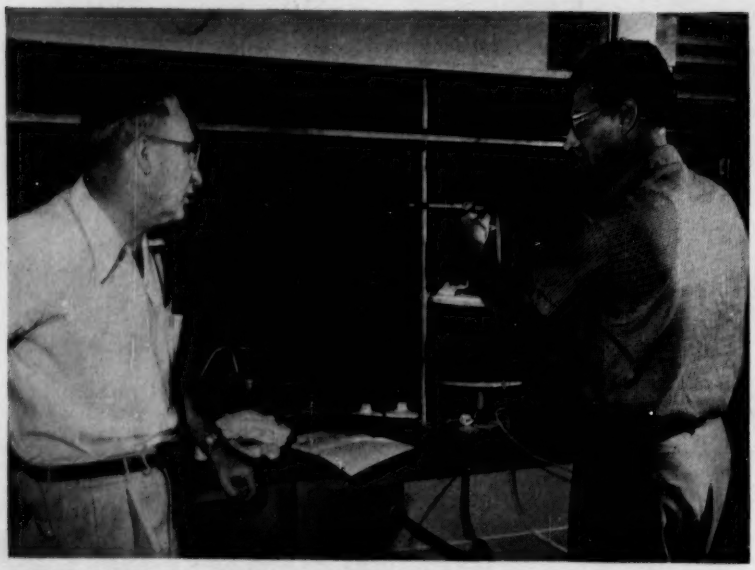


SHIRTSLEEVE PROFESSORS: Texas U.'s Cunningham and Texas A&M's Burkhalter help Dow's Texas Div. on special problems.

Summertime Stimulus

"Experience is the universal Mother of the Sciences." So said Cervantes. And so agree a number of professors who are heading back to ivy-covered walls after a summer of rounding out their theoretical knowledge with the practical experience of working in chemical plants. Pleased as punch, too, are the chemical companies that provide the employment.

What exactly does industry get out of these short summer contracts?

• Campus goodwill, for one thing. The chemical industry is heavily dependent on universities for its supply of technical manpower. One company frankly admits that its professor-hire program is primarily political. ("We want to keep our friends in court happy—what you might call campus politics.") A professor is more likely to send his best students to the company he knows best.

• Better trained recruits. The greater the teacher's practical knowledge of industry, the more realistic his teaching, and the better prepared his students for industry jobs. Says one personnel director: "It prepares the seed-bed for a new crop of technical graduates."

• Special skills. Professors with highly specialized knowledge can give companies valuable assistance—especially on short-term projects (*see cut*). They are often called on to fill in on research teams for vacationing regulars. Also: the fresh curiosity brought into the organization "strikes a spark and stimulates circulation."

Chief blessings for professors on summer employment in industry:

• Reinforcement of sometimes-slender academic salaries. The added security encourages good young men to stick to their teaching profession.

• Broader outlook. Chemists, engineers, biologists, even statisticians, get a good look at what makes industry tick, also update their information on industrial processes.

Take, for example, Stauffer Chemical Co.—and its first experiment with summertime employment of professorial talent. Stauffer had been thinking about such a program for a long time but never got around to it until a highly skilled chemical engineer was needed this summer for a specific study in its Richmond, Calif., lab. When a University of California professor, Charlie Tobias, with the right qualifications, hired into Stauffer, the die was cast. Typifying company reaction: Chet Arnold, Stauffer research director, was so pleased with results that he's planning to expand the program next year to the company's Eastern research laboratory.

Informality's the Key: While summer employment practices follow no set pattern (they vary greatly from company to company, from plant to plant), most chemical companies want, like Stauffer, to keep the program small, informal, intimate. It is seldom administered centrally, usually is determined by needs and inclinations of local plants.

Allied Chemical, for instance, is using one professor this summer (plus three high school teachers); Dow employs five in one of its divisions, two in another; 10 men were hired this year for work in Du Pont's Wilmington office, several others by local plants; a large Midwestern firm has four academicians; another has six; and the Atomic Energy Commission's Argonne Labs (where there's a year-round program in operation) hired 21 professors from 18 different institutions this summer.

Rarely do chemical companies formally solicit scientists from university faculties. They're more apt to choose them from men who apply on their own initiative, through personal contacts they've made at the schools, or just fortuitously. Sometimes, says one firm, it's a matter of reciprocating in kind.

"It's hard to refuse an application from a professor we depend on for spotting outstanding graduates."

One exception to the rule is a large Midwestern oil company that regularly recruits professors by discussing their interests and getting recommendations from department heads while on the usual graduate-seeking jaunts to colleges all over the country.

Little Publicity: Most companies are wary of advertising their interest in summertime professors, however. Since they hire a limited number (and those discreetly), they don't want to create an embarrassing situation whereby they'll have to disappoint a lot of applicants and invite campus illwill.

As one executive puts it, "It'll be a long time before anything will replace personal, sub rosa contact."

One thing every company scrupulously avoids: luring summertime talent away from college faculties with big offers of permanent jobs. Any suspicion of campus-raiding would destroy the goodwill that industry is so anxious to preserve. Moreover, it would be self-defeating. "If you hire a professor to give him experience, then put him to work full time," points out one company, "you'd have to start educating a new crop of professors to turn out the kind of graduates you want."

That's why the compensation paid professors is usually closely related to regular academic salaries.

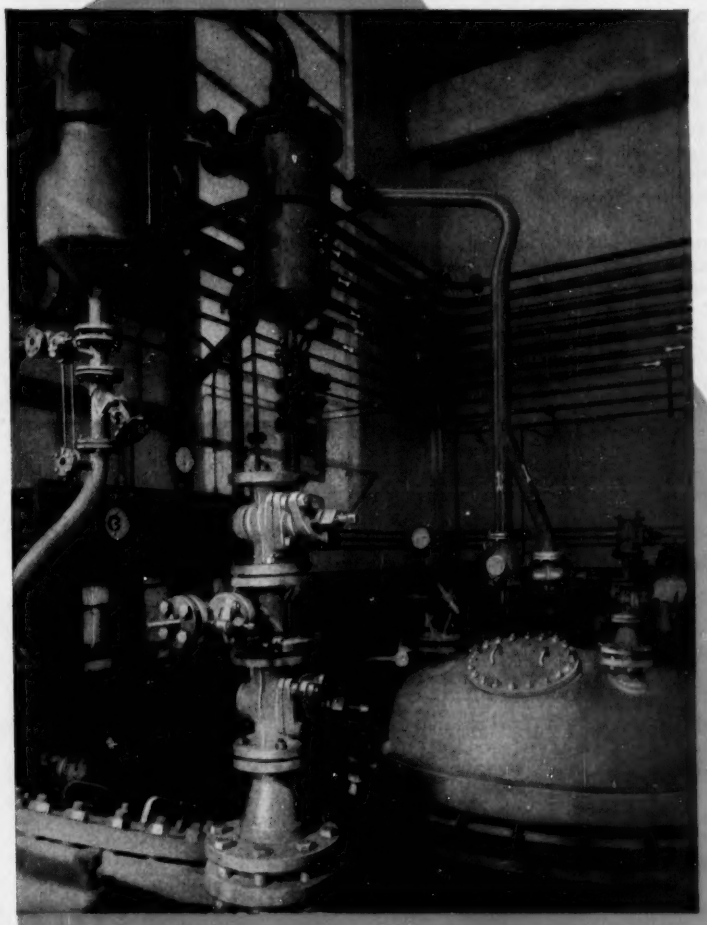
College communities familiar with the summer contract program— with some notable exceptions—have only one reservation: there's not enough of it. Consensus among them is that many companies don't fully realize how much professors can contribute to the solution of industry problems during the summer period, how willing they

Another SD project

new european PVC plant in production

One of the two largest chemical firms in Europe is now in commercial production with an improved polyvinyl chloride process. Developed and designed in collaboration with SD, the output of this new plant will be used in the manufacture of calendered film and sheet products, electrical insulation, and extruded and molded items, both plasticized and nonplasticized.

A contract for another plant in America, completely engineered by SD's staff for production of both mono and polyvinyl chloride, has just been completed by SD.



SD's experience in this field also led to the development of a *streamlined, low-budget packaged PVC plant*. Designed for both large and small firms, the new SD package plants can be built for production capacities anywhere in the range of four to fifteen million pounds of PVC a year.

In addition to this new PVC plant, SD has also concluded three other European developments within the past year—an antibiotic pilot-production plant for a Belgian research center, an ethylene oxide plant built for Naphtachimie of France, and a citric acid plant in collaboration with the Dutch firm of Noury & van der Lande.

In new plant construction *or* the revamping of existing facilities to increase production efficiency, you will profit by utilizing SD's specialized experience in organic chemicals plant design. Services are available to you, on a confidential basis, on any problem involving a process of your own, or one to be procured or developed.

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are to roll up their sleeves and have a crack at tough assignments. They point out that smaller companies especially are missing out because of their belief that professors come too expensive.

Advises a chemistry department head in one state university, "The junior faculty members are the ones who can contribute the most at the most reasonable price and they're also the ones who need experience the most.

No one, of course, expects a wholesale summer exodus of professors from the grove of Academe into chemical plants. But it seems certain, as more companies realize the attractions of such a program and experiment with it, the practice will become more widespread.

One Instead of Two

For chemical and pharmaceutical companies, whose research and development investments frequently are protected by trademarks and tradenames, there's much of interest in the revised rules of practice just proposed by the U.S. Patent Office.

Management men and lawyers will have until Nov. 15 to submit comments to the Patent Office on the suggested changes, which were worked out under the direction of Asst. Commissioner of Patents Daphne R. Leeds.

Generally speaking, the revisions are aimed at making Patent Office handling of cases more realistic—simpler procedures, less red tape in fact-finding, speedier disposition of cases.

Less Double-Dealing: A principal proposal would permit opposing parties claiming rights under similar registered trademarks (or applications for registration) to settle a case in just one proceeding, rather than in a multiplicity of actions.

Under existing rules, for example, if one chemical company files a motion opposing another company's application for registration of a trademark, the only way the applicant can challenge the opposer's registration is to file an independent cancellation proceeding. This results in two separate cases involving the same dispute, and consumes just about twice as much time.

This duplication of effort would be eliminated by the proposed revision; in such a case, the applicant would be allowed to bring out his entire argument without having to start new proceedings.

Lawyers Only — Almost: Other changes provide for adopting methods of fact-finding—such as pretrial discovery and increased use of written depositions to take testimony—patterned after the federal rules of procedure in civil lawsuits. Another alteration would eliminate the necessity of filing certified copies of the Patent Office's own records to prove title to registered trademarks, for instance. Instead, the Patent Office would take official notice of its own records merely on the motion of an attorney.

One more proposal would require that only lawyers be permitted to handle trademark cases in the future. This restriction is watered down somewhat, however, by a "grandfather clause" that would allow nonlawyers now permitted to practice before the Patent Office to continue handling these cases.

At this time, the revisions are hardly more than something to shoot at. It's expected that patent and trademark law committees of the national and various state and county bar associations will soon be offering criticisms and suggested changes.

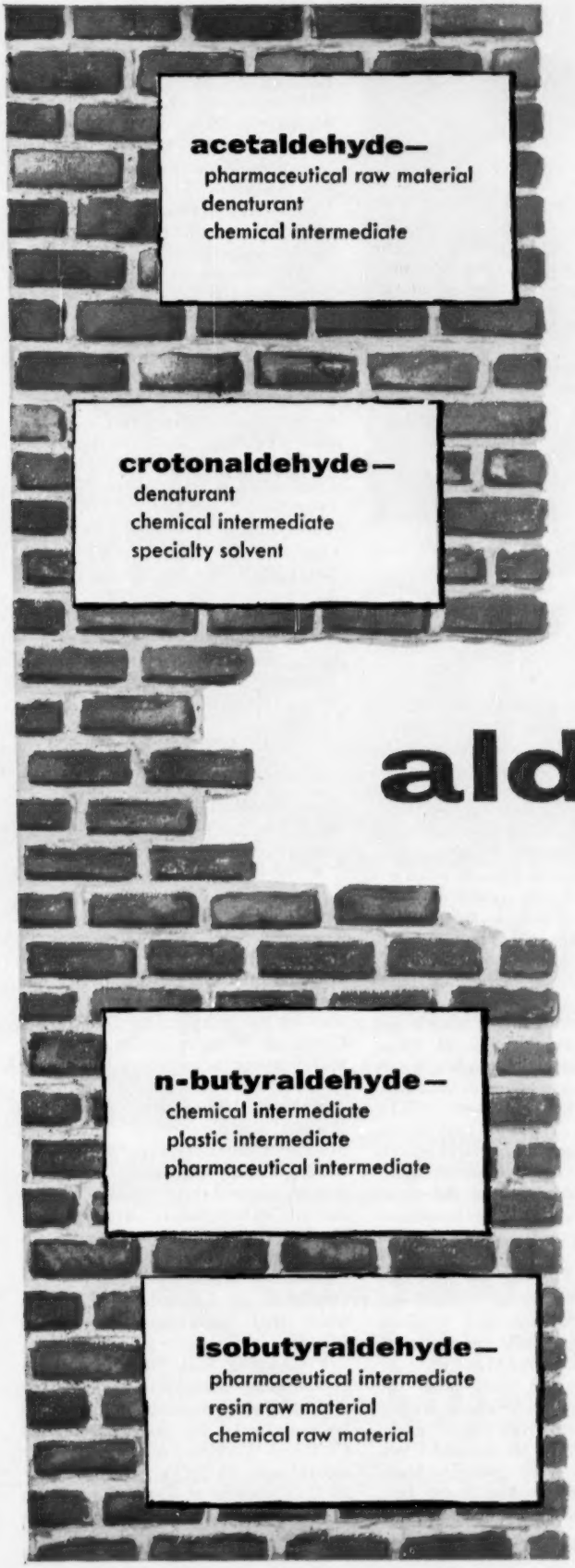
But Asst. Commissioner Leeds believes that while this new look in trademark rules may tend to lengthen somewhat the period from the filing of a given suit to the final decision, it will generally expedite the settling of trademark disputes. He predicts that the innovations will provide better trial procedure, eliminate costly clerical work, cut down the many requests for extension of time.

LABOR . . . . . .

Changing Scene: In negotiating new labor agreements, management can't afford to miss what's going on in the legislative arenas. Among current developments: the Attorney General's 60-member committee studying the antitrust laws is about to decide whether it should recommend making those laws applicable to labor union's "normal" activities; Missouri's State Chamber of Commerce is plugging for a law against compulsory union membership and a state senate committee is planning to introduce several bills against labor racketeering; a privately financed committee is seeking support for a "right-to-work" law in Maryland; Nevada residents will vote this fall on whether to repeal the right-to-work law they adopted two years ago; and California Governor Goodwin Knight says he'd veto a right-to-work bill if the legislature were to pass one.

In New Mexico, it looks as though the legislature will enact a minimum wage law next winter, both parties having endorsed this proposition.

Whether the antitrust laws should apply to labor unions is one of the most controversial issues facing the Attor-



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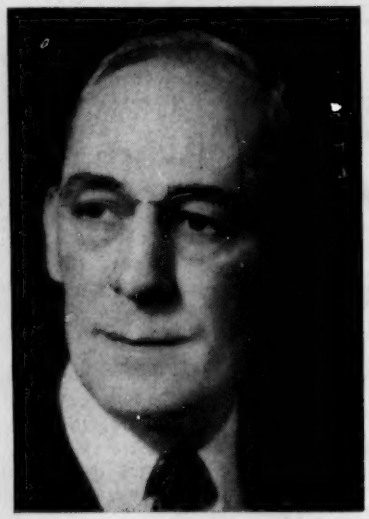


CHASE PHOTO

URW'S BUCKMASTER: To '54 wage pattern, he adds new 6½¢ upsweep.

ney General's committee; Secretary of Labor James Mitchell opposes the idea, employer groups favor it.

●

Close to Home: First big break in this year's 5¢/hour wage-increase pattern—and one that hits close to home for various parts of the chemical process industries—is the 6½¢ cash pay hike attained by the United Rubber Workers (CIO). This boost became unanimous among the country's biggest rubber companies last week when the union accepted an agreement that ended a three-week strike against Firestone. Previously, the 6½¢ provision had been granted by Goodyear, Goodrich, U. S. Rubber, Seiberling, Baldwin, and Richardson.

This is something of a feather in the cap of URW President L. S. Buckmaster, in that his union made a bigger industrywide wage gain this year than did the United Steelworkers (CIO), perennial pace-setter in pay drives, which settled with the big steel makers for a 5¢ cash boost three months ago.

Elsewhere, the nickel pay rise seems to be a common practice in latest contracts of concern to chemical companies:

• The new two-year contract between Reynolds Metals Co. and the International Aluminum Workers (AFL), covering 2,800 employees in Alabama, Virginia and Missouri.

• The agreement that ended the Mine, Mill & Smelter Workers' 16-day strike against Kennecott Copper Corp. in Arizona, Nev., N. Mexico and Utah.

• The one-year contract for truck drivers employed by the Ansco Div. of General Aniline & Film Corp. at Binghamton, N.Y.

• The wage reopener agreement between American Can Co. and the CIO Steelworkers for some 20,000 employees in 36 plants throughout the country.

• A multicompany agreement with the American Flint Glass Workers Union (AFL) affecting about 13,000 employees in the glass industry in various states.

While wages are actually being reduced in one auto factory, some chemical firms have been granting increases even handsomer than the rubber industry's pay rise. Locals of District 50, United Mine Workers, say they're getting a 17¢/hour general increase at the J. T. Baker Chemical Co. plant in Penn Yan, N.Y., and a 13¢/hour boost at the Green Spring, Wyo., plant of Food Machinery & Chemical Corp.'s Inter-Mountain Chemical Co.

●

Ousted as Leftist: In Seattle, Wash., Local 121 of the International Chemical Workers Union (AFL) has expelled the member who had refused to answer certain questions in a hearing before the House Committee on Un-American Activities. The local's membership voted to uphold a trial board's finding that Stanley Iverson was guilty of "conduct unbecoming a union member."

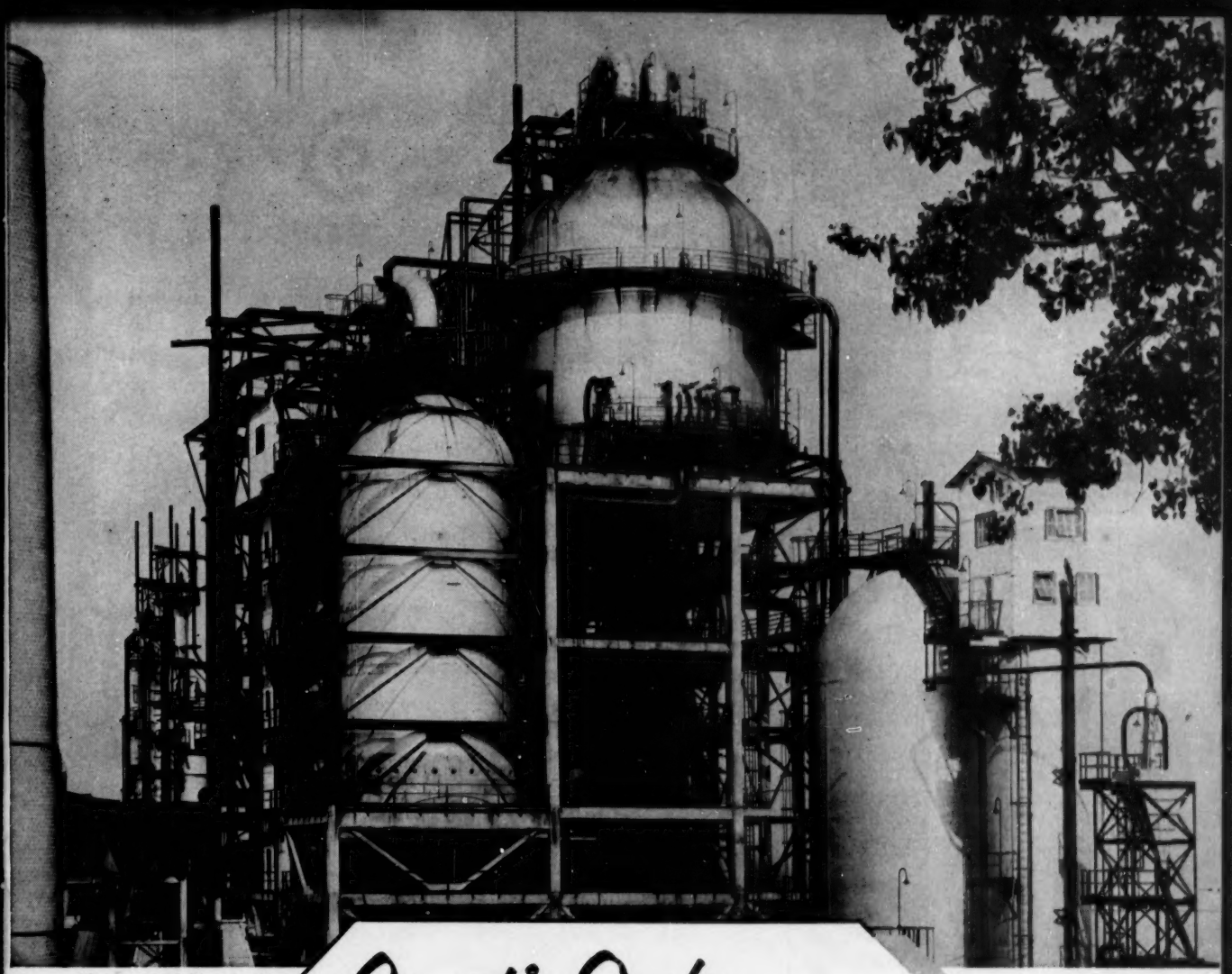
●

Three Small Strikes: Chemical industry strikes in the news the past week were all relatively small in scope:

• All but 30 of the 600 day-shift production workers walked off from their jobs at General Aniline's plant in Linden, N.J., as a protest over the suspension of eight employees, certain seniority practices relating to sick employees, and—according to a spokesman for the independent Dye Stuff & Chemical Workers Union—"the fact that workers on overtime shifts can't get hot meals."

• About 100 maintenance and operational employees at Monsanto's Mound Laboratory in Dayton, O., striking in support of new contract demands, accused the company of hiring several "strikebreakers" from Marion, O.; but the company explained that the persons referred to were three supervisors transferred from Monsanto's Scioto Laboratory at Marion when that installation was closed July 1.

• Charging that there have been exasperating "changes in working conditions" since the plant force voted to be represented by the International Chemical Workers Union (AFL) two months ago, all but two of the 25 production workers at the Indiana Farm Bureau's fertilizer plant near Jeffersonville, Ind., went on strike.



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FINDING NEW USES: Japanese authorities are counting on developing new markets to spur further plastics expansion.

FOREIGN. . . . . .

Plastics/Japan: The rise of the Japanese plastics industry, which virtually started from scratch after V-J Day, is surprising even its strongest supporters. Output of all types of plastics is soaring above 1953 production; ambitious goals are being set for further immediate expansion. Examples: the government plans for production of 17,000 metric tons of phenolics, 33,000 tons of urea resins, 55,000 tons of polyvinyl chloride, 3,000 tons of methyl methacrylate, 12,000 tons of polystyrene, and 5,000 tons of polyethylene, by 1958.

Further: Japan now manufactures 100% of the raw materials used in making urea resins, polyvinyl chloride, silicones, and alkyd resins, turns out two-thirds of the cresol for use in phenolics, and two-thirds of the acetone required for production of methyl methacrylate.

•

Titanium/Tasmania: Australian Titan Products Pty., Ltd.'s titanium plant at Burnie, Tasmania, plans to double its current production of 4,000 tons of titanium oxide per year. When the new level of production is reached, Titan executives claim, the company will be able to supply most of Australia's requirements for titanium oxide pigments.

•

Fertilizer/India: The government of India is considering the question of setting up two new fertilizer plants, in addition to the one at Sindri (Bihar), to meet India's growing demand for various types of fertilizers. One plant, according to K. C. Reddy, Minister of Production, is likely to be located at Nangal (East Punjab)—will be completed in 2-3 years. Sindri's annual production will be stepped up, too—by about 150,000 additional tons/year. The government's over-all goal is to supply about 1 million tons of fertilizers annually within the next several years.

•

Paper/Argentina: American capital, machinery, and know-how is moving into the Argentine market to help that country's paper manufacturing industry. The action is expected to greatly relieve the current newsprint shortage—said to be curtailing newspapers to six to eight pages a day. First U.S. company in: Sandy Hill Iron & Brass Works, Hudson Falls, N.Y.—which will furnish plant machinery and equipment to a large paper mill in the Province of Tucumán. Estimated output: 100 tons of paper daily.

•

Plastics/Argentina: Monsanto Chemical Co., St. Louis, has completed plans to invest slightly under $1 million in Buenos Aires, Argentina, to build a plant to produce plastics. Operating within the pattern of President Peron's foreign capital investment law, Monsanto plans to supply necessary plant machinery, and unavailable raw materials. The plant will be operated by Monsanto Argentina, S.A. (a newly formed subsidiary company); initially, production schedules call for polystyrene plastics and molding powders.

•

Nitrates/Greece: The World Bank mission, recently in Greece, has agreed

FOR ALKYL ARYL SURFACE-ACTIVE AGENTS
OF HIGHEST QUALITY

NEOLENE 400

INTERMEDIATE FOR SYNTHETIC DETERGENTS

There's good reason for the rapidly increasing use of Neolene 400 by the world's largest processors of synthetic detergents—and by other users everywhere. Neolene 400 has established itself on the basis of *superior quality*... in stability, in uniformity, and purity, in *performance* of the finished sulfonate. Look to Continental Oil Company for outstanding products processed from Neolene 400. Among these are:

DETERGENT SLURRY— for formulation — spray and drum drying.

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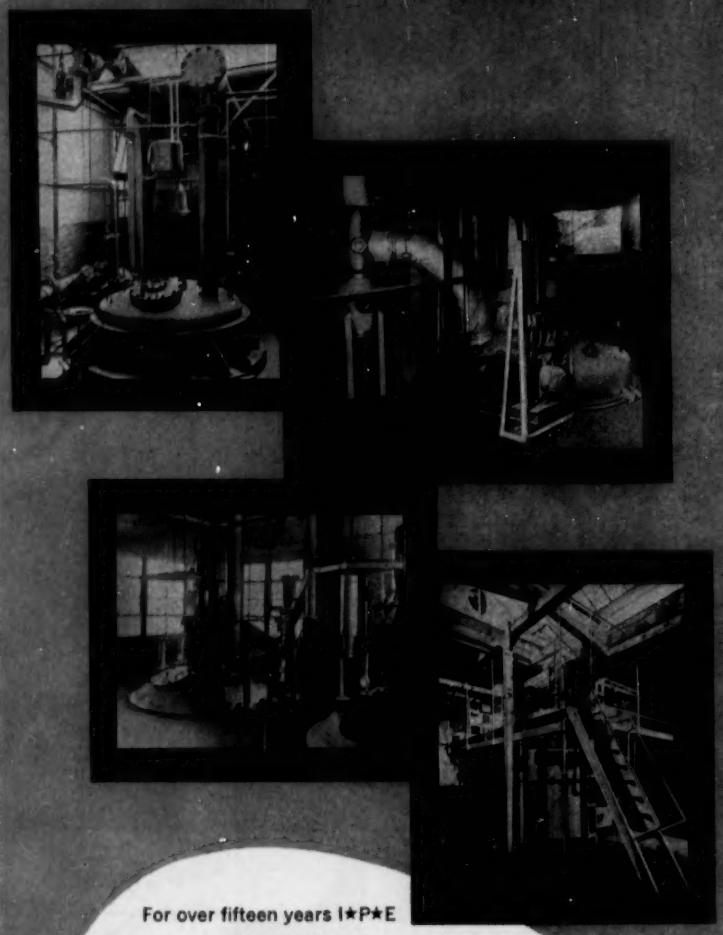

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to consider a loan to build a nitrate fertilizer plant, considered to be of vital importance to Greece's economic development. Detailed plans will be drawn up by a staff of fertilizer producers—to be appointed by the Greek government—before bids are opened to international competition.

It is the Greek government's aim to assure that the new nitrate facilities will be privately owned and operated. Talks, in this connection, have already taken place between government officials and the Bank regarding procedures to be followed in the issuance of the necessary stock capital.

•

Sulfur/N.W.I.: Lago Oil and Transport Co., Ltd. (a subsidiary of Standard Oil Co., New Jersey) has placed a 40-ton/day sulfur recovery plant in operation at Aruba, Netherlands West Indies. Girdler Co., Louisville, Ky. (a division of National Cylinder Gas Co.) handled all the design and engineering details.

•

Cement/Spain: The Ministry of Industry in Madrid has authorized expansion of Confederacion Hidrografica del Guadalquivar's Portland cement plant in Villaneuva de Rio from its present level (100,000 metric tons annually) to 175,000 metric tons. Cost: 60 million pesetas. Company executives say they will be forced to purchase much of the needed equipment and other materials abroad.

•

Titanium/Canada: Shawinigan Water & Power Co. expects to have its new semicommercial titanium metal plant at Shawinigan Falls completed by October. Construction work is proceeding on schedule, and company researchers are getting ready to shift their new production process from laboratory to pilot plant basis.

KEY CHANGES . .

Bernard Reiter, to treasurer, Nuodex Products Co., Inc., Elizabeth, N.J.

Raymond M. Bukaty, to director of marketing, General Aniline and Film Corp., New York.

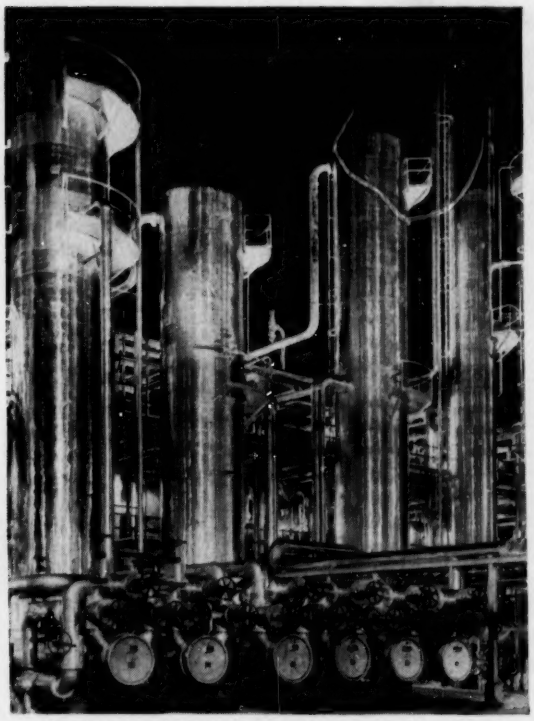
William F. Tomlinson, to director of research and development, Stepan Chemical Co., Chicago.

Joseph H. Paden, to director of laboratories, and **Mario Scalera,** to director of research, American Cyanamid Co., Bound Brook, N.J.

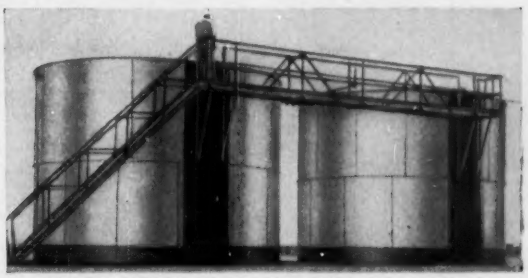
Robert L. Womer, to vice-president and technical director, Speer Carbon Co., St. Marys, Pa.

SEE HOW ALUMINUM CAN CUT YOUR COSTS!

These are a few of the many products that save money by lowering maintenance and increasing efficiency in chemical and petroleum processing plants. Reynolds does not make these products . . . but Reynolds Aluminum is used by the manufacturers who do. We'll furnish their names on request.



Insulation and vessel jacketing: Aluminum sheet in single layers over bulk insulation offers long life and maintenance free protection. Applied in separate layers, aluminum provides lightweight, moisture resistant, heavy duty insulation. Aluminum insulated and protected plants look better longer with less upkeep.



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Aluminum Gratings, Treads and Handrails: Aluminum installations like this grating will never require painting, are not damaged by sulfide atmospheres, and as a result, give longer life. Lightweight strength, installation economy and pleasing appearance make aluminum the preferable material.

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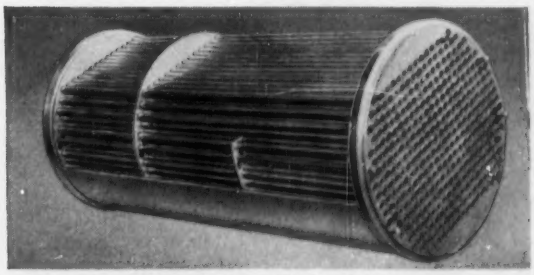

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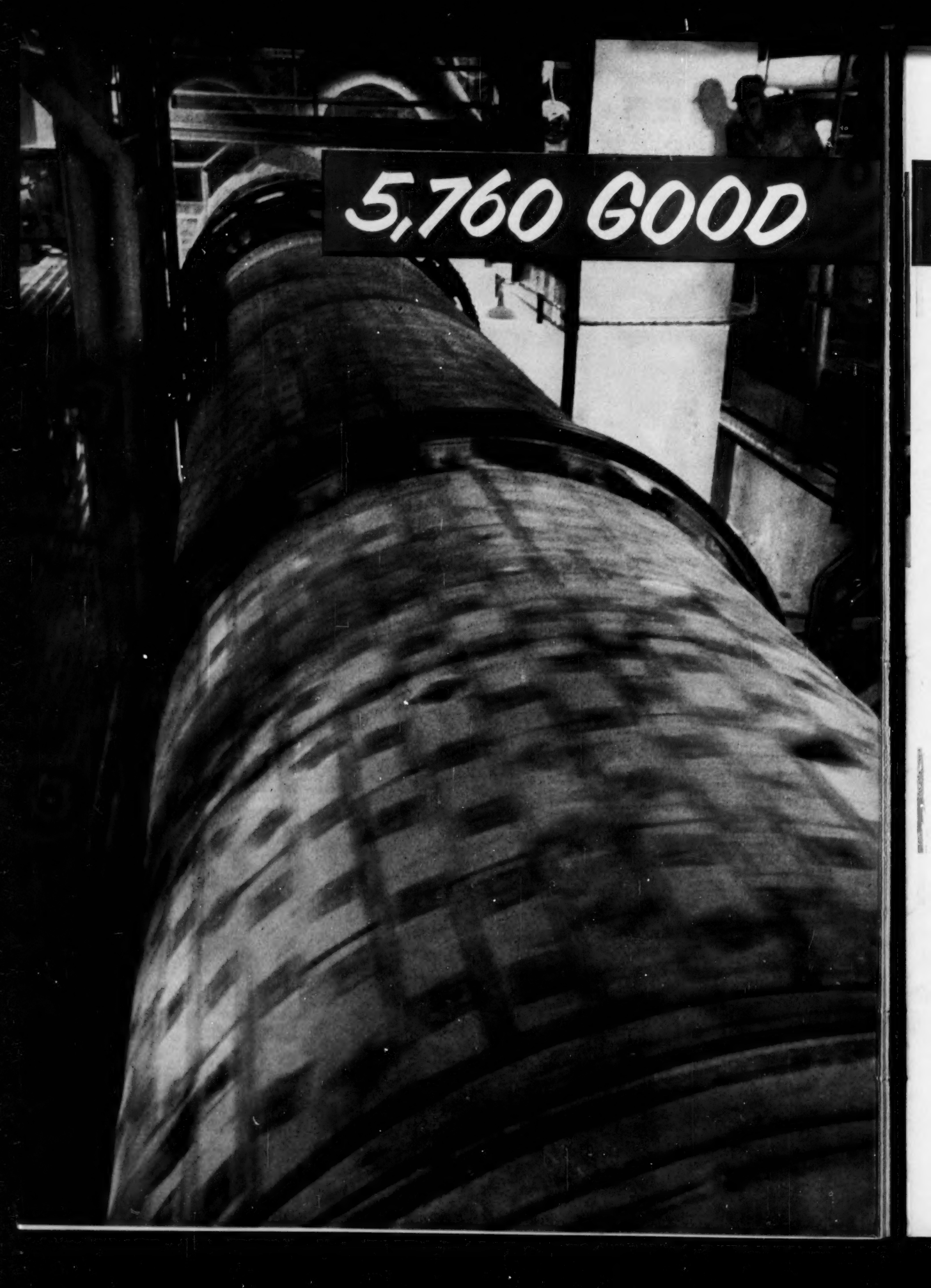
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Calcium Phosphates
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Phosphoric Acid
and many other products derived from Elemental Phosphorus

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SERVING INDUSTRY...WHICH SERVES MANKIND

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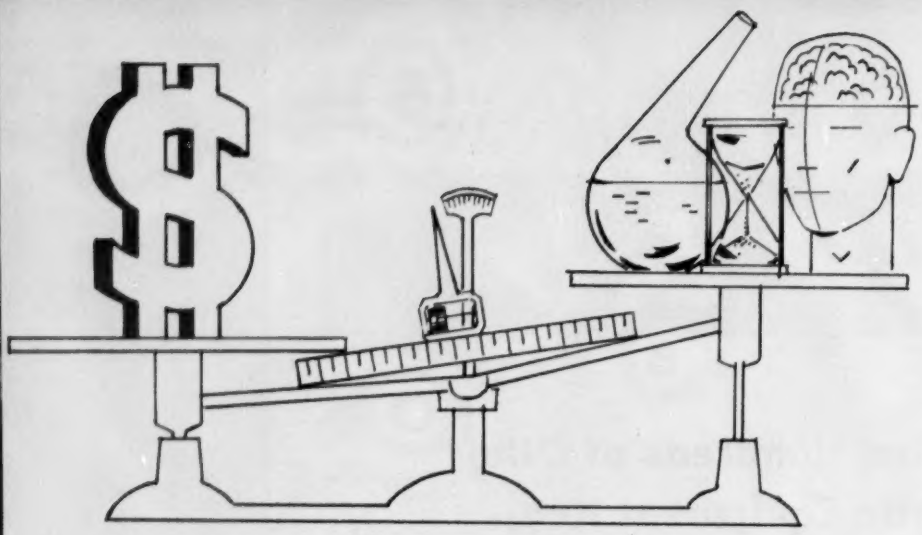


Vital: the knack of balancing probable costs against a nebulous profit. It's one highly important way to . . .

Get the Best Shake for Your Budget

ACROSS the nation this week, research directors are knuckling down to the familiar autumnal task of budget-making. For weeks and possibly months they will be grappling with an army of stubborn fiscal facts and figures. When their reckonings are complete, they must first face what can be the toughest part of the job—getting the proposed budget approved.

There's a welter of published information to guide the research director in setting up his budget. But nothing he finds between the covers of a book will tell him how to insure the soundness of that budget, or how to get it approved swiftly and smoothly.

There's still no substitute for experience in the fine art of constructing and steering a budget safely through channels. At least that's the consensus of more than 50 budget-making veterans contacted in a new CW survey of research directors.

One point they all agree on: a research director's best friend in this largely uncharted area is a well-developed business instinct. "It's the knack," explains the technical chief of a prominent firm, "of balancing all the probable costs against a nebulous profit return and coming up with the final assurance that the proposed project is right (or wrong) for the company."

Merely making a judicious selection of projects doesn't guarantee management acceptance. One research head, sensing the profit potential of a certain toothpaste additive, was completely unsuccessful in his attempts to get support for the necessary lab work. A competing firm meanwhile converted the same idea into an important new source of revenue.

Rule 1: Don't do it alone; get your staff to help ascertain needs, costs.

An idea, regardless of its glowing appeal to research men, must usually be sold to management. And that begins with an appraisal of what it will take to develop and test the budding invention. It's up to the director to determine what he needs in terms of staff, time and equipment, then translate these requirements into dollars.

This seemingly straightforward task can vary widely from firm to firm.

Big and Small: The research director of a small company making pharmaceutical intermediates, when questioned about his budget, explained that there just wasn't any problem in this regard. "We don't set up a formal research budget; that's strictly for large outfits. I guess at how much money we'll need for research next year, tell the owners, and get it. Of course we don't do any fundamental research; we concentrate commando-wise on special problems."

This kind of informality has its drawbacks. When management balked at the purchase of an infrared spectrophotometer, it took two years to convince them of its vital role as a research tool in the their industry.

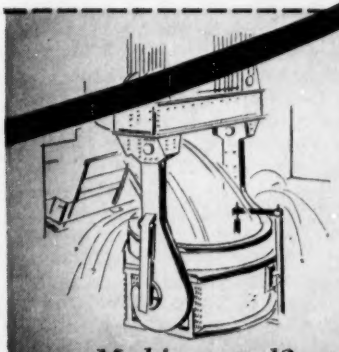
In contrast, the executive vice president of one of the world's largest research organizations, currently pressing his case for greater research

Rule 2: Get it all down on paper; you'll be surprised how it helps trim the fat.

What has *aluminum* got to do *with...*

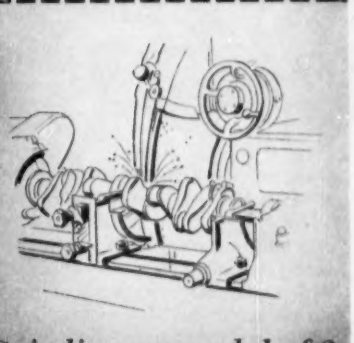
Salting an egg?

Purification of water?



Making steel?

Raising potatoes?



Grinding a crankshaft?

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Rule 3: Use charts and graphs to make your case unmistakably clear.

expenditures before the parent firm's board of directors, is armed not only with an itemized account of his research needs but also with figures on what competitive companies are spending. His budget represents a consolidation of separate estimates prepared at the department level.

Regardless of whether the research budget is large or small, complex or simple, it embodies the same general principles. Five tangible working principles, distilled from the confidences of successful research directors, can improve most budgets, enhance their chances of being approved. Here's what experience has taught.

1) Formulate detailed preliminary estimates. Consult with the research staff to ascertain their needs. Ideas and suggestions for more research projects than the budget can hold should always be on hand, comprising a backlog for presentation to management when the time is right.

2) In the actual preparation and evaluation of a preliminary budget, it's important to get the department's requirements down on paper, work them over, weed out those items that have a slim chance of acceptance. Here, too, the director's staff can be an important source of decision-aiding information. The scheme for passing on department-inspired projects is to estimate research cost, determine a possible selling or competitive price for the proposed product (market research data is helpful here), then gauge cost of production and earnings in proportion to cost. An estimate of the future potential of a suggested product is also helpful. Nonprofitable projects can be screened out here.

3) The final budget should be a well-thought-out, detailed document. And it's wise to include a concise summary sheet for easy interpretation. Charts, graphs, and other graphic aids can also make the budget more lucid, facilitate ultimate acceptance. There may not be time to go into detail when it's submitted for approval. One director, who bats high in the fund-garnering league, puts it this way. "There is always a certain amount of the subjective in preparing and reviewing any research proposal. The capable director will do his best to make subjective impressions lend support to his objective proposals."

4) Armed with a proper budget, the research director should be sure that before presenting it to management he has all his facts crystal-clear and the answers to challenging questions at his fingertips. Management people can come up from either research or production, or may be experts from the fields of finance, sales, purchasing, etc. They can think of a lot of ticklish questions. Basic tenet: if the reviewers are ex-research people, a straightforward, cards-on-the-table approach is best.

5) Finally, there's the highly intangible element of personality that enters into all dealings between people. Some research directors probably get a whole lot more than others simply because they're well-liked and respected. It's a difficult area to define, especially in the framework of the business world, where dollar-and-cents objectivity is supposed to reign unchallenged. The consensus on this score is well put by a vice president who has been passing on research budgets for a number of years. "The research director must sell his budget specifically, and his entire program generally. Of course, the best way to sell both is to be able to point to concrete developments reflecting profitable investment in research. But the more usual method of selling is through personal contacts with the board of directors and the company's executive officers. At our company, the research director prepares a quarterly report which he delivers in person to the board. This is his opportunity to get his views across and influence management's thinking."

Other pointers on this score from a similar source: "Management's confidence in its research director should keep arguments over the budget to a minimum. The research director's problem is to keep management from giving only lip service to research, not to argue over individual projects in the research program. And never let management think you are getting everything you feel you should."

The clincher, "When a research director's absolute minimum is not approved, it's time he looked elsewhere for a job."

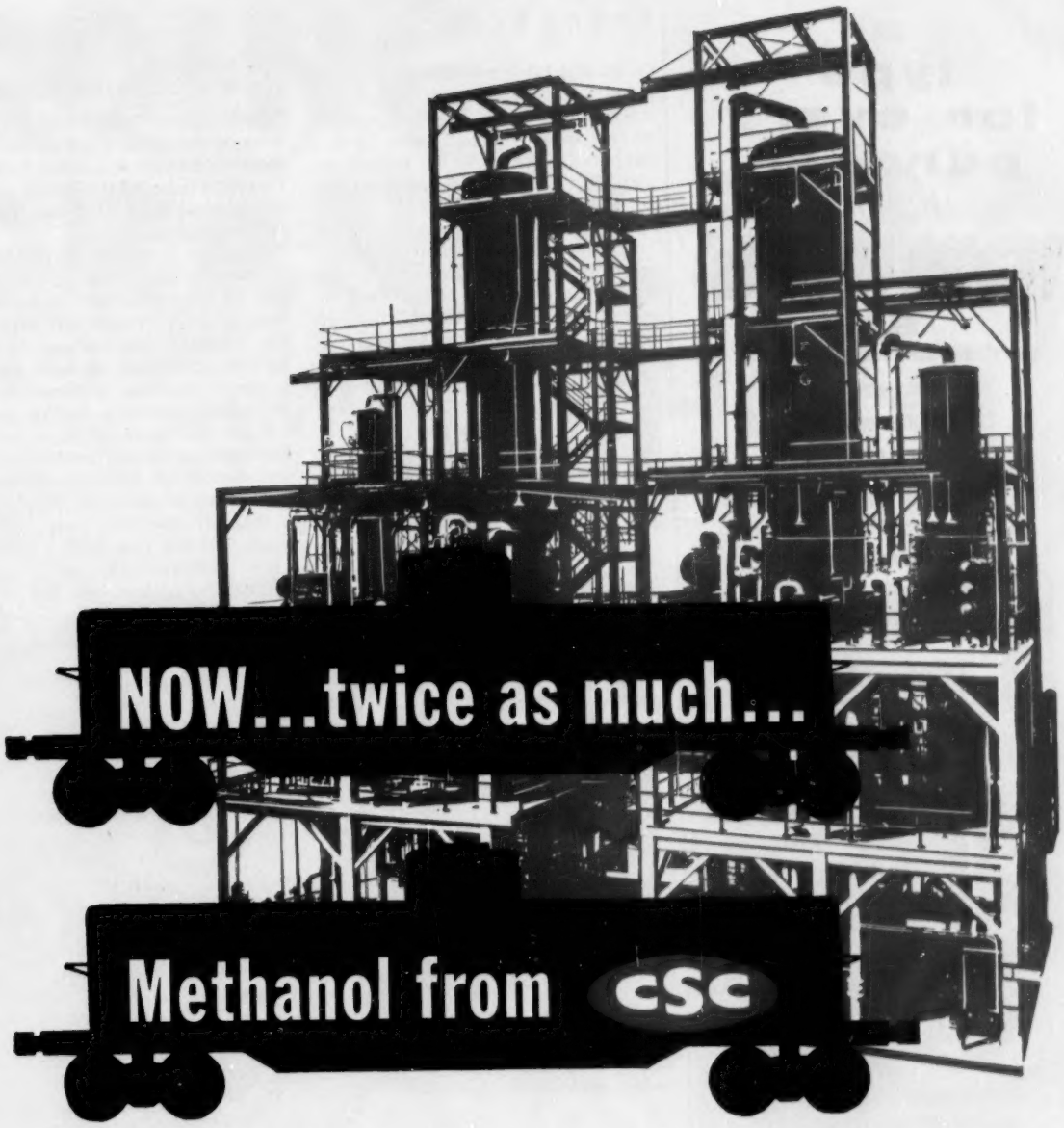
First Things First: It's also true that economic conditions and management's desires can and do affect the research budget. In times of rough going it may be necessary to lop 5 or 10% off the budget, regardless of its merit. Sometimes, too, management pressures may force the setting up of special projects not provided for in the original budget. In such cases there isn't much recourse—previously scheduled research jobs just have to wait and the money for them diverted to the new activity.

A long time research executive of a prominent heavy chemicals firm sums it up: "A research director who wants to be successful in preparing budgets that management will accept will have his goals pretty well in mind for the next 3, 5, or 10 years. And he will adjust these goals from year to year as he prepares his budget. In some years he will find it will be more diplomatic to ask for less than his objective would call for; in other years he will find it opportune to ask for more than he otherwise would.

"In other words, when the company has extended itself financially (as in capital expansion), or when a promising research project sours, a prudent research director will pull in his horns at budget time. Conversely, when the research department has just made a hot strike or more money is available (through loans or stock issues), he should ask for as much as he thinks he can get." In the largest firms, research budgets are usually geared to dollar volume of sales or a similar index.

Agreed: There are lots of opinions

Rule 4: Confidence is vital; have all your facts and figures at your fingertips.



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on what it takes to convince management to accept a research budget once it is formulated. But there is unanimity on one score: you had better have a pat hand before asking for the money, and even then there's no guarantee you'll get the full amount.

Other words of wisdom:

"Be intensive rather than extensive," counsels one veteran research executive. "Inexperienced men tend to spread their budgets too thin by getting into a whole flock of projects that may take years to mature. Invariably, these jobs cost a whale of a lot more than you figure them for at the start. This kind of thing speaks poorly for your judgment."

A colleague has this to contribute: "Temper enthusiasm with a second thought to dollars and cents. And, above all, keep your department pipeline well stocked with projects that will reach completion at more or less regular intervals. There's nothing as satisfying to management as relatively frequent reports of mission accomplished; keep them waiting too long and their ardor for research is liable to cool."

Rule 5: Personality counts; to sell your budget sell yourself.

Of course, any one who believes he has a sure-fire formula for getting exactly what he wants, all the time, is in for a rude jolt. There just isn't any way to insure results in every one of the multitude of budget situations that may arise in the chemical industry. But the odds on a favorable outcome can be narrowed considerably by a little extra effort and a knowledge of the "do's" and "don'ts" of the game.

New Hormone Quest

"Shades of cortisone," may well have been on the minds if not on the lips of research men present at last fortnight's Canadian debut of the British medical-biochemical team of James Tait and Sylvia Simpson.

Introduced at University of Montreal by director Hans Selye of UM's Institute of Experimental Medicine and Surgery (*CW Newsletter, Sept. 11*), the scientific pair focused a bright light on a new and vigorous quest for a steroid hormone synthesis. Goal of the probe—currently taxing the resources of a score of pharmaceutical firms and academic institutions here and abroad—is a synthetic aldosterone.

Reduced to essentials, it's almost as if the cortisone story were unfolding again, but this time with a new cast. Like cortisone, aldosterone is an adrenal steroid hormone that exerts a profound stabilizing influence on certain vital body processes that get out of kilter, with disastrous consequences.

In character with its renowned predecessor, the new hormone was long a physiological puzzle,* isolated and crystallized only recently (last year). Credit for this major achievement is due to Swiss chemists of Ciba and the University of Basle. They started with beef adrenal glands, discovered that aldosterone was even more sparsely available than cortisone from this classic source of the latter.

At the present state of extractive efficiency, it takes about eight tons of beef adrenals to yield a speck of the hormone the size of a pinhead.

And that's the ratio that researchers on at least two continents are trying to render academic. Impetus for their efforts derives chiefly from the work of biologist Simpson and medical man Tait—the former, head of biological research at the Courtauld Institute of Biochemistry, the latter a lecturer in medical physics at Middlesex Hospital (both of London).

They recently proved that the elusive bovine hormone is also produced in humans, thereby releasing a flood of tantalizing speculation on the potential value of the compound in therapy. Believed to be the most powerful adrenal hormone, aldosterone might conceivably be a supercortisone, may even open completely new fields of therapeutic effectiveness.

But right now, at least, that's pure conjecture. About all that physiologists are willing to assume is that the scarce hormone will be valuable in the treatment of Addison's disease, a relatively

* Its presence has long been suspected, but its isolation and identification has consistently stumped researchers.

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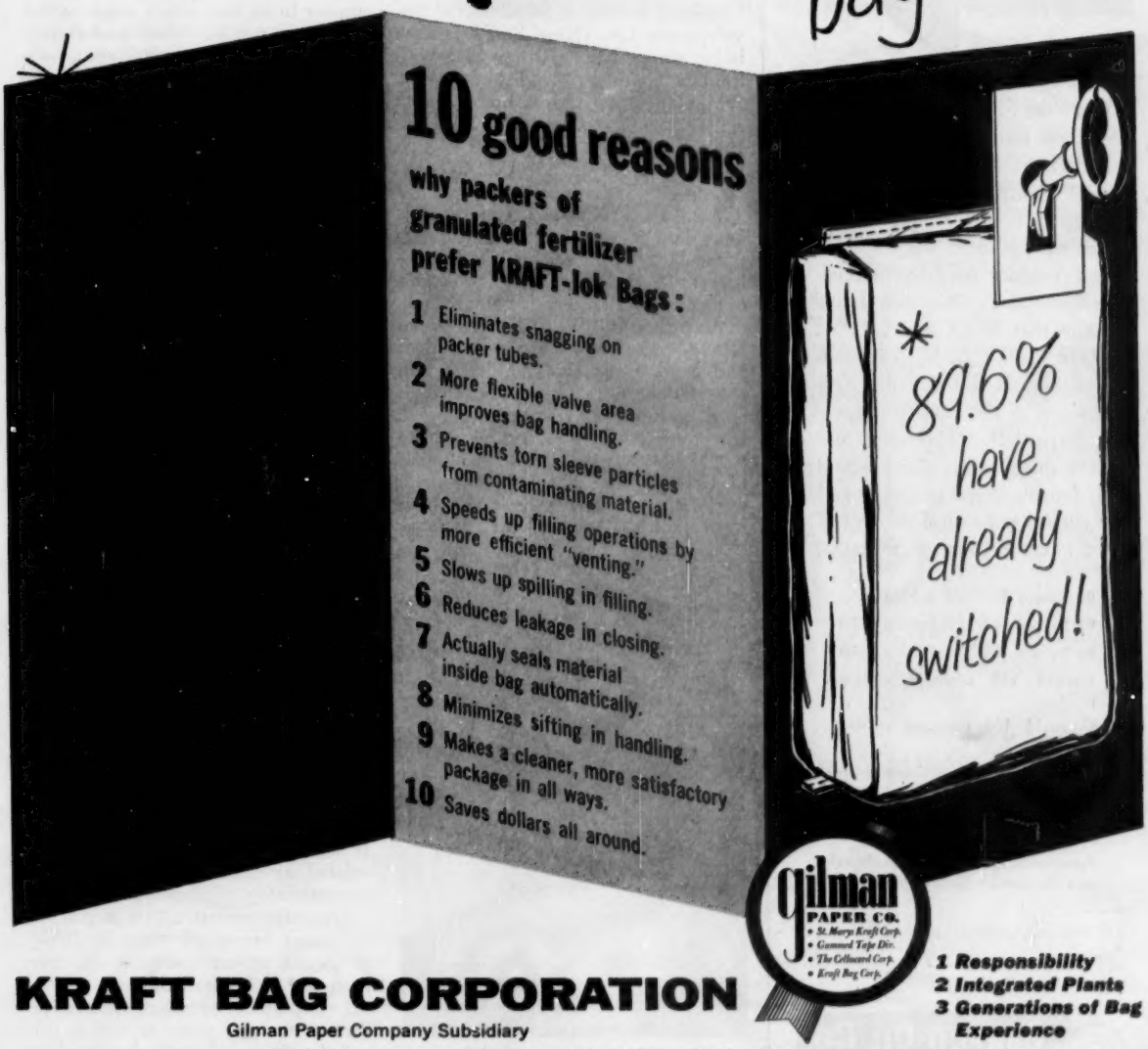
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rare endocrine disturbance characterized by severe muscular weakness and browning of the skin.

Filling in the remainder of the medical picture and eventual commercialization of aldosterone will not be possible until a great deal more of the substance is available for evaluation. To speed this day, Ciba and several other firms with an established hormone interest are pushing synthesis research in earnest. The attitude of university synthesis seekers, of broader scope but no less determined, is typified by the position of scientist Selye, who characterizes the hormone as "a lever to pry open more of the secrets . . . of the human body."

Licensing Surge

Licensing activity at Standard Oil Development Co. (New York) is now being stepped up to keep pace with the company's growing list of patents. Prime targets for the push are foreign refineries, particularly in England, France, Germany and Brazil, which have lagged behind the U.S. in high-octane gasoline production.

Esso feels outsiders can use its know-how in such fairly recent developments as fluid coking, fluid hyroforming, hydrofining, and new versions of its fluid catalytic cracking technique.

According to Willard Asbury, an Esso Development Co. vice-president and head of its contract, legal, and patent department, the new move is no departure from traditional policies. It's prompted, he says, by the need to put to best use the mounting number of Esso patents. About 400 of these were granted last year—more than were garnered by any other member of the oil industry. Esso now holds more than 4,000 U.S. patents, almost as many foreign ones.

ESSO'S HOLT: Patent packages are his problem.

To bolster its licensing drive, Esso has just appointed its Philetus Holt and Leonard Carlsmith to provide technical advice to potential licensees, act as liaison between them and contractors and engineering units of the company.

Since the general practice is to license a package of patents (on a process like fluid coking, for example), their task is less complicated than it might appear. Essentially it's a matter of determining if and how querists can use Esso's processes.

Lab in a Doughnut

Aside from storing oil, there wouldn't appear to be very much use to which you could put an ordinary oil storage tank. Unfettered by convention, however, enterprising Continental Oil has gone to work on a cavernous 80,000-bbl. job, is transforming it into what is anything but an ordinary research building.

It's all happening right now at the company's recently completed Ponca City, Okla., research center.

Designed to resemble a doughnut, the novel structure (when completed) will contain three stories, a center well running from ground to roof. A travel hoist will be suspended over the shaft; laboratories, offices and pilot-plant facilities will cluster around its periphery on the three levels.

A genuine eyebrow raiser, the unusual setup makes sense to Conoco research people. At first blush the idea of a doughnut-shape structure "was fantastic," reveals Conoco Vice-President Harold Osborn. "But the more we considered it," he concedes, "the more practical and interesting it appeared." Perhaps foremost in his reckoning is easy accessibility.

If it accomplishes nothing else, the unique design reduces to child's play the problem of installing and positioning pilot-plant apparatus and large laboratory instrument units.

Part of Conoco's petrochemical development operations, the new layout is expected to cost about $500,000. It will provide 33,000 sq. ft. of insulated, air-conditioned floor space for approximately 60 researchers.

Once the new structure is put into operation (expected early in 1955), it should attract attention on more than one score. Its aluminum-painted exterior, offset by what Conoco describes as "gay awnings and a canopied entrance," will be hard to ignore on the Oklahoma plains.

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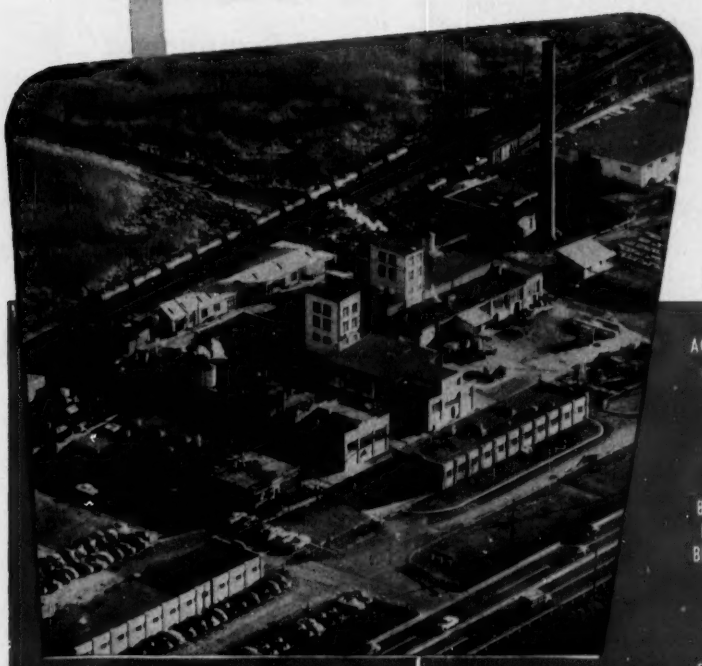

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New Brainpower

Even electronic brains fall into intellectual cliques; the more advanced the brain, the more exclusive the group. Last week, one of the most highbrow mechanical minds went to work for a petroleum company. A general-purpose, stored-program digital computer —one of less than 100 of its kind that labor in government and universities— was installed at Gulf Oil's Harmarville, Pa., laboratories.

A $110,000 investment, the new computer is expected to rapidly repay its cost by speeding complex calculations that are becoming more and more frequent in every phase of petroleum research. The electronic brain reputedly totes up its answers 50 times faster than a mathematician equipped with an electric desk calculator and several hundred times faster than an expert endowed with anything less.

By replacing the mortal mind in this fashion, Gulf hopes to accomplish three major things:

- Speed the solution of a variety of research-spawned mathematical problems.
- Relieve professional scientists from long and tedious calculation.
- Permit its research staff to tackle problems previously considered too costly in terms of man-hours of labor required.

In more tangible terms, here's what the machine is expected to do:

In process research, evaluation of yields and other experimental factors should be vastly accelerated. Calculation time of these projects may well be reduced from hours to minutes.

In physical studies, time required for mass spectrograph use with its sub-

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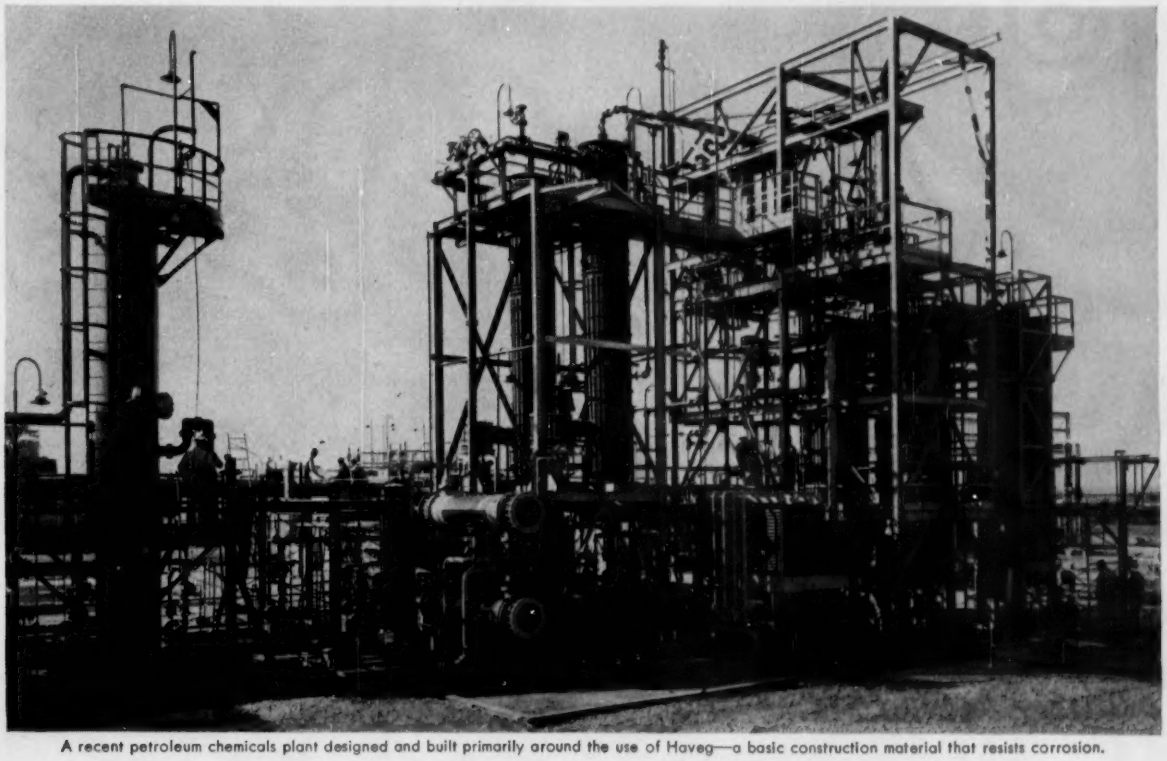

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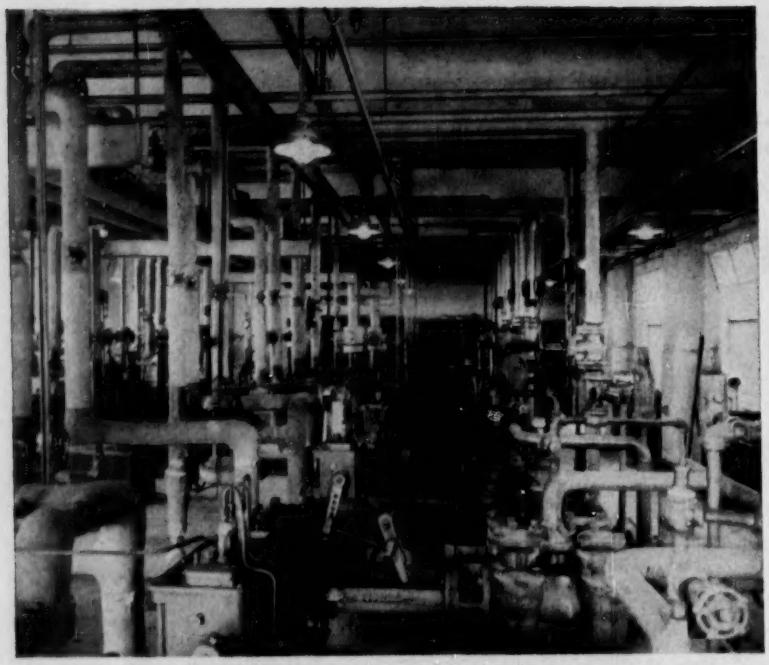

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sequent mathematical analysis cannot fail to be substantially reduced.

Engineering design should benefit in like fashion. Figures set up to compare different refinery designs can reportedly be run off at a speed that makes such traditionally expensive studies pay off.

In petroleum prospecting the mechanical brain should speed up the interpretation of data compiled by airborne instruments (magnetometers, etc.) Data of this kind is now coming in at a prodigious rate.

Finally, problems that are usually too prohibitive to tackle at all (e.g., numerical evaluation of atomic structure of hydrocarbons) may well be brought within the limits of feasibility.

Despite these profound talents, Gulf researchers are not awed by their electronic aid. They look upon it as nothing more or less than it is—a high-powered mechanical calculator. The machine is helpless unless all the necessary steps of a problem are properly laid out in advance, then fed (in coded form) into the machine.

A problem is first encoded in numbers—with certain figures representing the directions such as "add," "multiply," etc.—on a punched paper tape. Then these directions are fed to the machine through an automatic electric typewriter, which the tape operates like a player piano.

While the computer merely follows the "orders" so received, its abilities can seem amazing. If so instructed, it can choose a series of alternative courses of action, develop its own program for solving some problems, on occasion change its instructions, and call back from "memory" figures used in previous calculations.

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In physical form, the "memory" is a cylinder with a magnetizable coating at the center of the machine, which holds encoded instructions in the form of magnetic impulses. An auxiliary "memory," represented by magnetized tape in a separate cabinet, greatly increases the number of instructions and/or 10-digit numbers that can be stored—so that they total over 100,000.

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Developed to supplement Uscolite* pipe and fittings, the new Uscolite bodied Hills-McCanna Diaphragm valve, now makes it possible to utilize Uscolite's advantages throughout your piping layout. The unique Saunders patent design of the valve coupled with the chemical resistance of Uscolite makes the valve ideal for plating, water treatment, and in the manufacture of fertilizer, bleach, storage batteries, pulp and paper, etc.

The Hills-McCanna Uscolite bodied valve is available in standard sizes from ½" through 2". It is suitable for pressures to 150 psi and for temperatures to 170° F. (at some sacrifice of pressure rating in larger sizes).

Write for details. HILLS-McCANNA CO. 2445 W. Nelson St., Chicago 18, Ill.

DESIGN DETAILS

- Working parts isolated from flow.
- No packing.
- Leaktight under pressure or vacuum.
- Simple pinch clamp closure principle.
- Minimum maintenance even in the severest service.

HILLS-McCANNA

saunders patent diaphragm valves

Also manufacturers of
Chemical Proportioning Pumps • Force-Feed Lubricators
Magnesium Alloy Sand Castings

Signs of Progress

A quartet of new developments are giving research men something to think about this week.

- For selectively removing mercaptans from aqueous solutions, National Heart Institute (Bethesda, Md.) chemists have prepared a new resin by mercurating a phenol-formaldehyde polymer. Recovery of the trapped mercaptans is by elution with hydrogen sulfide solutions.
- Chelation of copper and uranium and other metals can be accomplished with the aid of a new complexing agent. Obtained by the condensation of 4-quinolinecarboxaldehyde and *o*-amino phenol, it was discovered at the University of Istanbul (Turkey).
- High *in vitro* fungistatic potency, low toxicity in mice are dual properties of 3-4-methylenedioxybenzylidene-4-carboxyaniline and its component aldehyde, piperonal, according to Commercial Solvents (Terre Haute, Ind.).
- Anisomycin is Charles Pfizer's (New York) name for a new antibiotic, which has been isolated from two different species of streptomyces. It is said to have marked *in vitro* activity against protozoa.

•

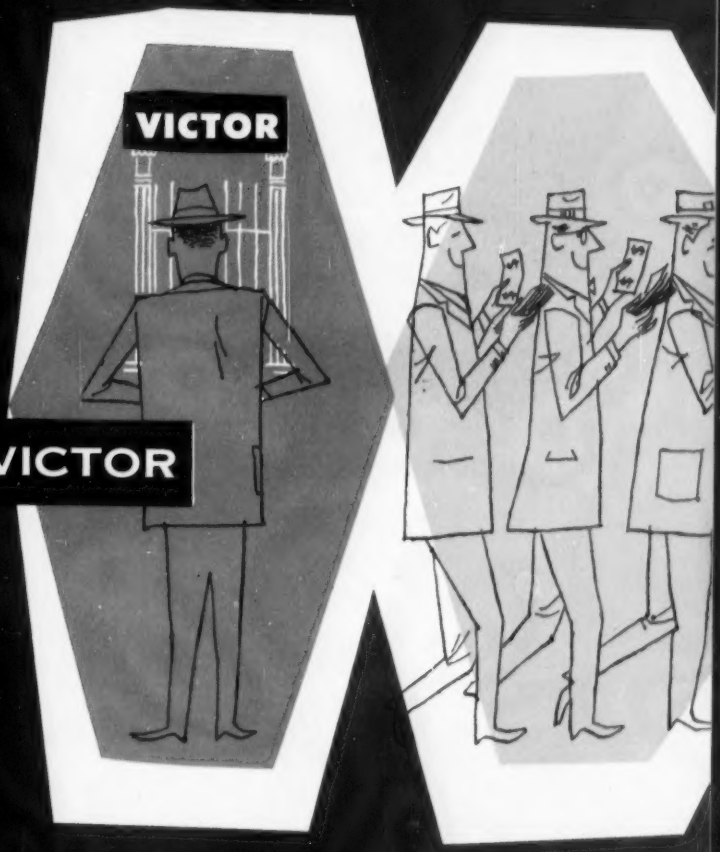
Tobacco Cure: In Toronto, a chemical control for tobacco suckers (shoots that grow out from the main stem) is under test at the Central Experimental Farm. Agricultural chemist, E. T. McEvoy says preliminary results show that either an emulsion of equal parts of mineral oil and water or a solution of maleic hydrazide in water will scotch the unwanted growth.

•

Substrate Kit: To aid in the isolation and differentiation of enzyme systems derived from living matter, Mann Research Laboratories (New York) now offers a protease substrate kit consisting of nine selected substrates and one activator. Priced at $22.50, the outfit should be a convenience to biochemists.

•

Nuclear Study: First of its kind, a new course in nuclear engineering will be offered this fall at Illinois Institute of Technology (Chicago). William Lewis, dean of Illinois Tech's graduate school, says the course will review fundamentals, include reactor theory, "pile" management, personal protection, radiation damage, and chemical reprocessing. Walter Fagan (who helped to develop the atomic-powered submarine, *Nautilus*) will give the course, primarily for industrial people who already hold an engineering degree.



IT PAYS TO SEE VICTOR

VICTOR
Chemicals

HOLD THE COLD

Makers of facial tissue have a double problem. Their product must be "strong enough to hold a sneeze . . . absorbent enough to hold a cold." To get needed "wet-strength" in these tissues, paper makers use acid-setting resins to make the tissue-paper fibers stick together. As a catalyst for these resins, ammonium phosphates are required. *It pays* to see Victor.

AMMONIUM PHOSPHATES—Typical Uses: Ammoniated dentifrices, soda cracker pH control, catalyst for resins, chrome dyeing of wool, one-bath dyeing of Dacron-wool blends, flame-proofing, plant nutrient solutions. Manufacture of yeast, vinegar, bread improvers, and alcohol. Acid cleaner for metal.

LET'S KEEP 'EM ROLLING

Better-than-ever mileage from motor oil is the result of new oil additives. Phosphorus pentasulfide (P_2S_5) is an important intermediate in the manufacture of these additives, but until recently it lacked uniformity, was frequently off-color, and contained specks. Victor research overcame these disadvantages by preparing P_2S_5 in a new manner—by distillation. Now, phosphorus pentasulfide is speck-free, uniform and a brilliant canary-yellow color . . . important advantages in the production of "golden-colored" motor oil. Another instance where industry has found . . . *it pays* to see Victor.

PHOSPHORUS PENTASULFIDE—Typical Uses: Intermediate in the production of thiophosphates for oil additives, flotation agents, insecticides, and other chemicals.

AN ACID BATH THAT WORKS WONDERS

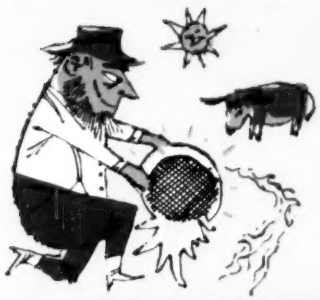
Painting metal products such as refrigerator shells, automobile bodies and the like is no easy job. Rejects due to chipping or blistering of painted surfaces can be costly. Leading manufacturers eliminate this problem by treating the metal to a bath containing Victor phosphoric acid. This bath not only renders the metal rust-resistant, but provides an "etched" surface that furnishes a perfect bond for paint. If you finish metal, you'll find *it pays* to see Victor.

PHOSPHORIC ACID—Typical Uses: Manufacture of yeast, sugar, soft drinks, gelatin and pharmaceuticals. Rust-proofing, chemical polishing, petroleum refining. Manufacture of phosphates, glue, ceramics, metal-treating compounds, and fertilizers.

"WELL TAN MY HIDE!"

Leather tanners count on Victor sodium formate to speed tanning time. When sodium formate is added to chrome tanning solutions, the chrome liquors are stabilized; rapid, uniform penetration of the leather takes place; fixation is increased and more chrome is exhausted from the solution. In addition to these advantages, the leather has greater smoothness and fullness. Sodium formate is one of the most effective masking agents for chrome tanning. Tanners, too, agree that *it pays* to see Victor.

SODIUM FORMATE—Typical Uses: Chrome tanning, neutralization of leather, wallpaper printing, plating baths, reducing agent, blueprint developers, neutralizer for carbonized wool.



IT ALL COMES OUT IN THE WASH

Combine soap with hard water and you're asking for trouble! Soap plus hard water forms insoluble curds which give clothes that "grey" look. In time, these curds also tend to "gum up" automatic washing machines. To prevent this formation, makers of automatic washing machines recommend synthetic detergents. Most of these detergents contain sodium tripolyphosphate. Both "tripoly" and tetrasodium pyrophosphate have outstanding water-softening action and detergent qualities. That's why "soapers" use them . . . they help homemakers get a cleaner, sweeter, whiter wash. Here's a case where another industry finds *it pays* to see Victor.

SODIUM TRIPOLYPHOSPHATE—Typical Uses: Soap builder, manufacture of detergents and water softeners, purification of china clay, deflocculant in raw cement slurries, conditioning of oil drilling muds, anti-pitch agent in paper manufacturing.

BRILLIANT ON THE IVORIES

When it comes to brilliant smiles, dentifrice manufacturers come to Victor. That's because Victor phosphates are used as the polishing agent in most toothpowders and pastes. Victor research pioneered the development of di- and tricalcium phosphates as polishing agents. Foremost dentifrice manufacturers capitalize on Victor's expert knowledge of their needs by specifying these special phosphates, the first to merit the approval of the Council on Dental Therapeutics of the American Dental Association. Another example where *it pays* to see Victor.

DICALCIUM PHOSPHATE, VICTOR—Typical Uses: Mineral supplement in cereals and foods. Pharmaceuticals, polishing agent in nonalkaline toothpastes and powders. (U.S. Patent 2018410)

IT PAYS TO SEE ...

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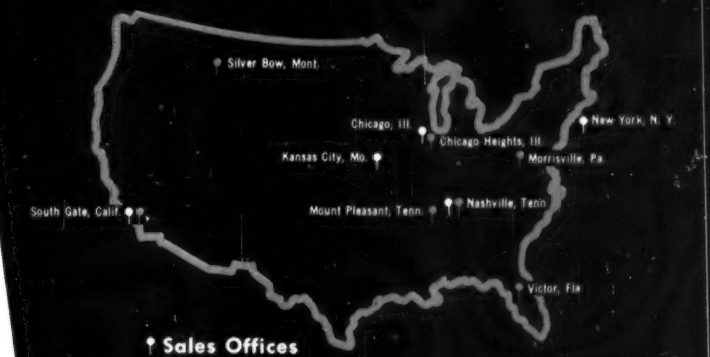


Sales Offices

Plants

if **FOODS** *are your special interest*

please turn to the next page

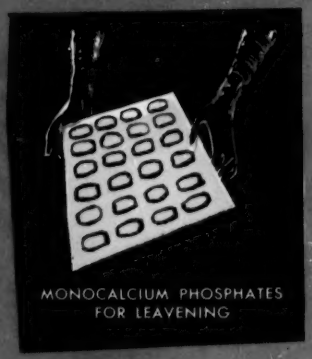
HAD YOUR PHOSPHATES LATELY?

Of course you have! Take your morning toast or luncheon rolls, for example. Chances are they were made from flour enriched with calcium phosphate, with yeast cultivated with ammonium phosphate and with salt kept free-flowing by a trace of tricalcium phosphate. What's more, phosphates were in your sugar, condensed milk, process cheese and a score of other food favorites, including your soft drink.

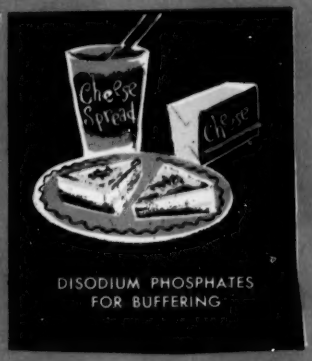
If you manufacture or process food, you're probably familiar with the versatility of phosphates. Also, you're probably aware of Victor's outstanding leadership in phosphates. Victor's plant facilities, research staff and sales service organization are yours to use. The next time you have a product or process problem that a phosphate might solve, call on us. You'll find that *it pays* to see Victor.

VICTOR SERVES THE FOOD INDUSTRY

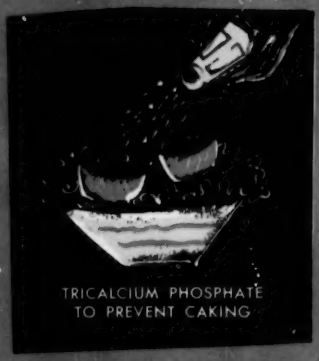
AMMONIUM PHOSPHATES—Manufacture of yeast, vinegar, yeast foods, pH control of soda crackers, bread improvers . . . CALCIUM PHOSPHATES—Mineral enrichment, leavening agents for self-rising flour, self-rising corn meal, pancake flour and prepared mixes; baking powder. To prevent caking of salt, soda, and sugar . . . IRON PHOSPHATES—Iron enrichment . . . PHOSPHORIC ACID—Manufacture of yeast, sugar, soft drinks, imitation jellies, gelatin . . . SODIUM ACID PYROPHOSPHATE—Baking acid in prepared mixes, doughnuts, flours, ingredient in baking powders.



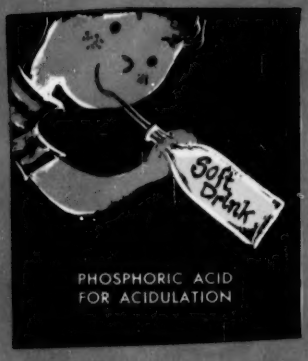
MONOCALCIUM PHOSPHATES FOR LEAVENING



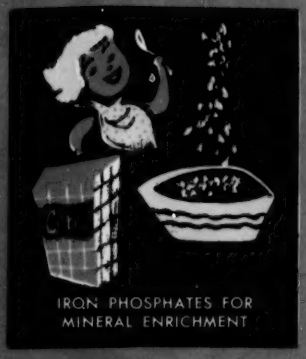
DISODIUM PHOSPHATES FOR BUFFERING



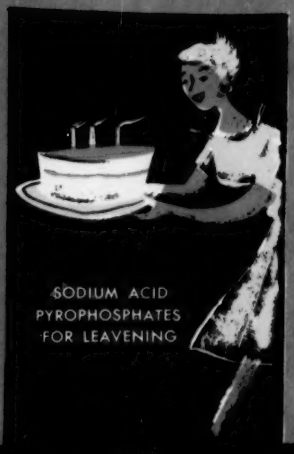
TRICALCIUM PHOSPHATE TO PREVENT CAKING



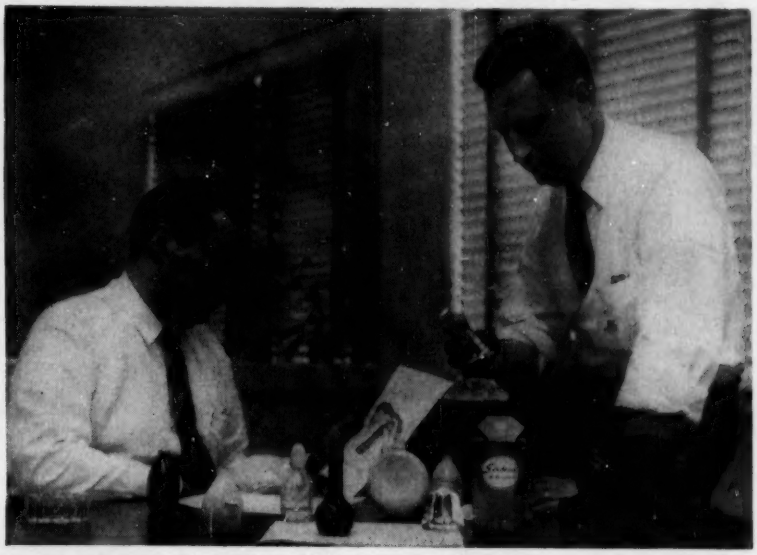
PHOSPHORIC ACID FOR ACIDULATION



IRON PHOSPHATES FOR MINERAL ENRICHMENT



SODIUM ACID PYROPHOSPHATES FOR LEAVENING



WHEATON'S GLOVER AND MARKS worry out problems, schedule production.

Glamorizing with Glass

"The glass aerosol is in!" That's the latest news in the aerosol industry. The 'horse's mouth' on the subject is Wheaton Plastics Co. (Mays Landing, N.J.), which is credited with developing the ultralow (under 25 lbs.) pressure, plastic-covered bottles that are currently causing a flurry in container circles.

Their appearance in the past few months has prompted both enthusiasm and skepticism. While it's up to the buying public to decide whether or not they are safe to use, the chances are they will eventually win over the skeptics and will push aerosols into fields heretofore regarded untouchable.*

Here is the situation as Wheaton sees it. It wasn't until last April (after three years' work on the idea) that the company found itself in a position to produce the novel containers "on a mass scale at prices within reason."

Over 100 Companies: While the main takers so far have been large cosmetic firms—Corday, Coty, Wrisley, Lehn & Fink—Wheaton tells CW that it now has dealings with over 100 companies on a variety of products.

The trouble-shooters for Wheaton are Bill Glover and Al Marks (*see above*). The former is in charge of production and development of the new product, the latter is aerosol sales manager.

Right now both are up to their necks in orders from cosmetic firms eager to get their colognes and perfumes into glass aerosols before the Christmas rush begins. They are also swamped with inquiries and orders from foreign concerns.

The bottles (available in sizes ranging from 13 cc. to 6 oz.) are made at Millville, N.J., by the Wheaton Glass Co., then shipped to Mays Landing—17 miles away—for coating and decorating. As for the coating, it's a vinyl chloride. Suppliers are Goodrich, Firestone, and Carbide and Carbon, who sell it to formulators, who in turn send it to Wheaton.

Any Color, Any Design: It's offered transparent, translucent, opaque, or in any color desired. Bottles are either decorated and then coated, or vice versa. They're sold in three stock designs—the rounded square, tapered oval, Boston round—or they are custom-made.

According to Glover, Wheaton has a capacity to turn out 100,000/day. Present production is in the neighborhood of 50,000/day.

While Wheaton has applied for patents to cover the manufacture of the aerosols, it has no illusions about remaining the sole producer in the field. "There's nothing to stop others from going in for protective coatings," Glover says.

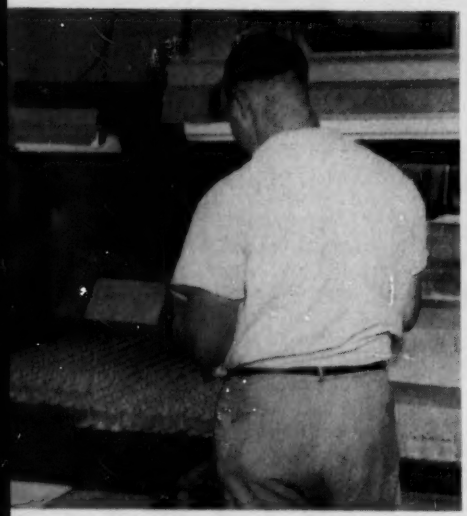
Metal or Glass? Furthermore, though Wheaton sees a big future for its plastic-coated aerosols, it does not feel they will oust metal containers.* To begin with, there's the problem of price. Glover will not name any actual figure, but it's generally known to be around 7-8¢ for the 2-oz. size. (A 6-oz. metal container is around 5¢.)

Aside from the price factor, makers of metal containers feel they have an

* For example, the host of moisture- or alcohol-containing products that have proved too corrosive for metal cans.

* Opposition has come from fillers, Glover reports. "Just a week ago," he explained, "I talked with a filler who said he would never let a glass aerosol be filled in his plant. Then one of his big customers called, said he wanted glass. Now the filler has changed his mind—he can't afford to stay out of the business."

BLOW-MOLDED on an automatic machine at Millville, glass aerosols are . . .



PACKED and sent to Mays Landing, where they're seen entering and coming out of a machine that coats them with vinyl chloride.

"edge" because of the nonbreakability of their aerosols. Wheaton's claim: "If the bottle should drop and the glass break, the glass won't spatter . . . for it can't cut through the cover."

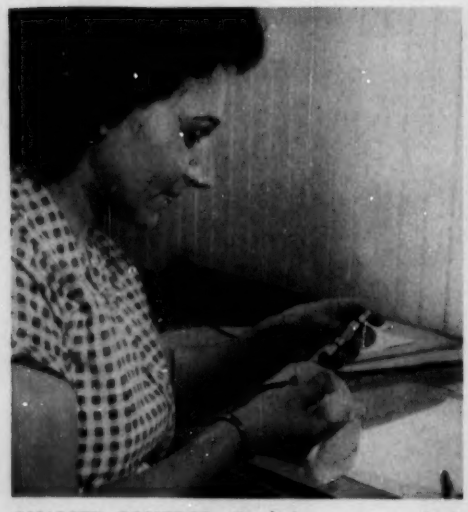
Despite Wheaton's assertion, many marketers will continue to prefer metal to glass. Understandably, they will be scared off by the possibility of damage suits that might result from a customer's misuse of the aerosol. At the same time, however, they will be tempted by the "see-through" qualities of glass packages and the adaptability to unusual shaping. Which viewpoint will triumph, only time will tell.

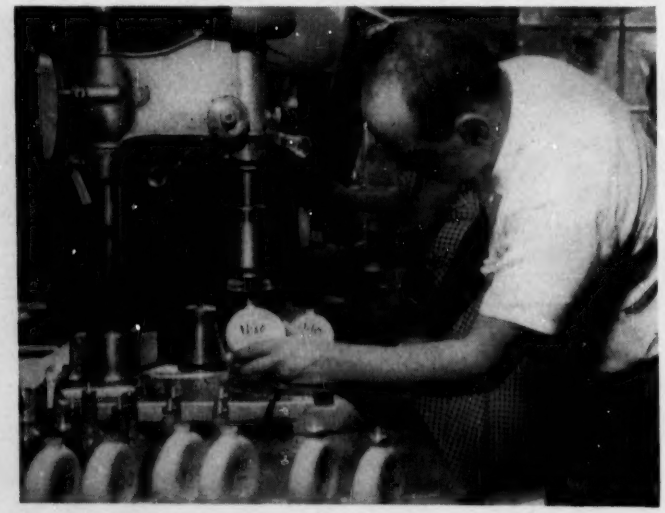
Trail-Blazer: In Wheaton's favor is the fact that Zonite Products Corp. has already done trail-blazing for glass. Early last year it brought out its Larvex mothproofer in a glass aerosol housed in a protective fiber. Since then Zonite has applied for patents and has licensed a three-phase ultralow (11-15 psig) pressure system employed in the Larvex package. The system uses Du Pont's Freon 114 as the propellant, gives a spray of high alcohol concentration with only a small amount of propellant.

Though Zonite says the system is usable in any type of container, it has pushed the glass bottle as "the logical choice." Zonite's contention is that pressures below 15 lbs. make a coating unnecessary. Not coated, a glass aerosol sells at around 2-2½¢.

One Filler's Opinion: Asked by CW for his opinion on coated versus uncoated glass aerosols, one of the country's largest fillers said that (1) while uncoated bottles are currently the best, appearancewise, they require careful control of pressure; (2) they are not likely to go over a 3-oz. size; (3) the trend will ultimately swing to coated bottles as the coating is improved—in cost, appearance, tensile strength.

Besides competing with metal containers and uncoated glass, Wheaton will buck two other types—aluminum and plastic. As yet the plastics have not gone commercial, but their makers say they will "very soon." One is all-nylon. It's being developed by





QUALITY CONTROL: Bottles' covers are checked for thickness, retentiveness. Filling and valve-crimping precedes . . .

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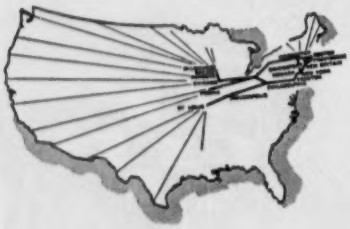

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DROP TESTING: Coating must support claims that glass can't splatter.

Precision Valve Corp. (Yonkers, N.Y.). The other is a melamine product bearing the tradename, Pyrosol, which will be made by Pressure Packaging Co. (Pyro Park, Union, N.J.).

Major obstacle holding aluminum back: a high leakage rate. Sun Tube Corp. (Hillside, N.J.) says that it has a method of manufacture that eliminates leaks. It reports that it recently filled an order for 500,000. Though the cost is high (7½¢/2 oz. can), aluminum proponents feel that since aluminum is lighter than either tinned metal or glass, savings in shipping may bring it in line with the other two.

Improving Outlook: What's bound to give glass aerosols, coated and uncoated, a boost is the improving propellant outlook. Production of Freon 114 (dichlorotetrafluoroethane), the propellant of choice for pressures below 25 lbs., was previously earmarked chiefly for the Atomic Energy Commission—as recently as this summer. Today Du Pont has enough for all customers.

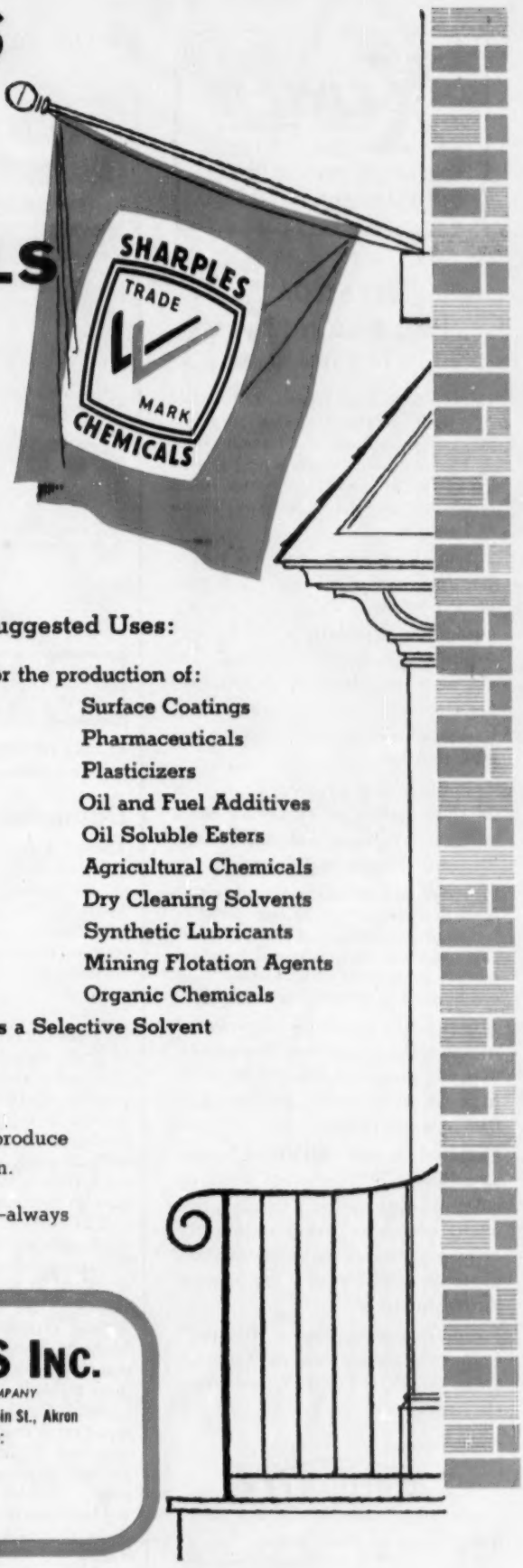
According to General Chemical, it will soon offer a propellant comparable to Freon 114. Name: Genetron 320. Another, Genetron 101 (monochlorodifluoroethane) will be available before the year is up. General says the latter has an even greater stability in the presence of essential oils than Freon 114. (Wheaton buyers also use mixtures of Freon 114 and dichlorodifluoromethane — Freon 12 and Genetron 12).

Because glass aerosols are still in their infancy, Wheaton can't say how many types of products will end up in them. It does mention shampoos, talcum powders, and pharmaceuticals. An example of how big the market will be: a single product—antiperspirants—may account for some 50 million glass aerosol packages next year.

Thus, it would appear the glass aerosol bandwagon is going to be crowed in a relatively short time. Among the companies climbing onto it, many will undoubtedly be chemical specialties makers.

INSPECTION: Bottles come from decorating lehr, get a final glance.

HEADQUARTERS for SYNTHETIC AMYL ALCOHOLS



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PENTANOL-1
n-Amyl Alcohol

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Suggested Uses:

For the production of:

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- Pharmaceuticals
- Plasticizers
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- Agricultural Chemicals
- Dry Cleaning Solvents
- Synthetic Lubricants
- Mining Flotation Agents
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In addition to the alcohols listed above, we can produce other isomers and blends tailored for your application.

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Makes Greaseproof Papers For Fatty Food Wraps

Completely hydrolyzed grades of "Elvanol" polyvinyl alcohol form excellent greaseproof coatings on paper and paperboard which can be used profitably in packaging butter, oleo, lard, nuts, doughnuts, cookies, bacon and sausage.

"Elvanol" is easily applied to paper from water solution by means of conventional sizing and coating equipment. Upon drying, "Elvanol" forms tough, flexible coatings that are unaffected by oils, greases, and most organic solvents—including hydrocarbons, alcohols, ethers, esters, and ketones.

The films also provide protective barriers against air and other gases such as hydrogen sulfide, carbon dioxide, oxygen, and nitrogen.

Economy and versatility are other features of "Elvanol" to be considered in formulating greaseproof coatings. Low-cost extenders such as starch and dextrin are compatible with "Elvanol" and can be used to cut coating costs.

Where paper products are expected to remain in use over a long period of time, greater flexibility of coatings can be obtained by the addition of a plasticizer.

"Elvanol" is also well suited for use as a binder in pigmented white or colored coatings for paper. Again, where economic considerations are of primary concern, a combination of starch and "Elvanol" can be used satisfactorily.

For more information on "Elvanol" write to: E. I. du Pont de Nemours & Co. (Inc.), N-11507, Wilmington, Delaware.

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OMITS LESS TOO... HANDY PACKAGE OF AM-O EQUALS 1½ QUARTS OF FULL-STRENGTH LIQUID AMMONIA

PLUG FOR AM-O: For a twist in household ammonia, powder in a container.

Domestic Helper

There's a brand-new household specialty on the grocers' shelves this week in Columbus, O., Lansing, Mich., Madison, Wis., and Sioux City, Iowa. It's Am-O, an ammonia-producing washing compound developed by B. T. Babbitt, Inc. (CW Newsletter, Sept. 11).

Still strictly a test market item, Am-O may yet undergo a few changes—e.g., in grain size. Right now, it's a light blue, salt-and-pepper appearing grainy powder, containing 22% ammonia. It's packed in a blue and white Babbitt-made, 10½-oz., all-metal container with an easily opened screw top (*see cut*). Price is averaging about 28¢/can now in the test cities.

The 10½-oz. can of Am-O will produce the equivalent of 1½ qts. of full-strength household ammonia when dissolved in water. But typical directions call for a heaping teaspoonful for the ordinary pail of wash water. Morever, besides providing ammonia, Am-O provides suds, because it contains a (blue) detergent.

Scrub Combo: Chemically, the formulation is one of ammonium carbonates and bicarbonates, with a built, anionic detergent. It sounds like a pretty simple formulation job, but Babbitt feels it has a few compounding tricks that make it possible to patent Am-O.

Am-O, a name that goes well with Babbitt's familiar scouring powder, Bab-O, didn't originate with Babbitt. It was purchased from Sapolio Products, Inc., makers of an abrasive soap called Sapolio. Sapolio had also given some attention to another washing compound, Ammo. Ammo was advertised as an ammonia-producing product, but was originally largely washing soda with ammonium sulfate.

That formulation was, according to "J. L." Perlman, who heads Babbitt's new product development committee, rather typical of the so-called ammonia-producing compounds that had been marketed thus far. Perlman believes the new Am-O is a unique formulation.

Soft Touch: New Am-O is claimed to be easier on the hands than are comparable washing products. The sturdy but easily opened can is designed to keep contents from caking, and the formulation is said to yield no choking fumes, and to be nonpoisonous.

Am-O, as Babbitt's latest weapon in its war on dirt, looks as if it has interesting sales possibilities. It boasts the convenience that has boosted so well in powder-type bleaches. And though still just being test-marketed, it can be made at the Babbitt Albany plant in "substantial" quantity. From here on, it's up to the housewife.

Dusters' Special

Agricultural chemical makers are casting an interested eye at the newest design in dusting and spraying airplanes, the Ag-2 farm-forest airplane, designed by Transland Co. (El Segundo, Calif.). The first models should be flying soon.

Among the features of the new ship:

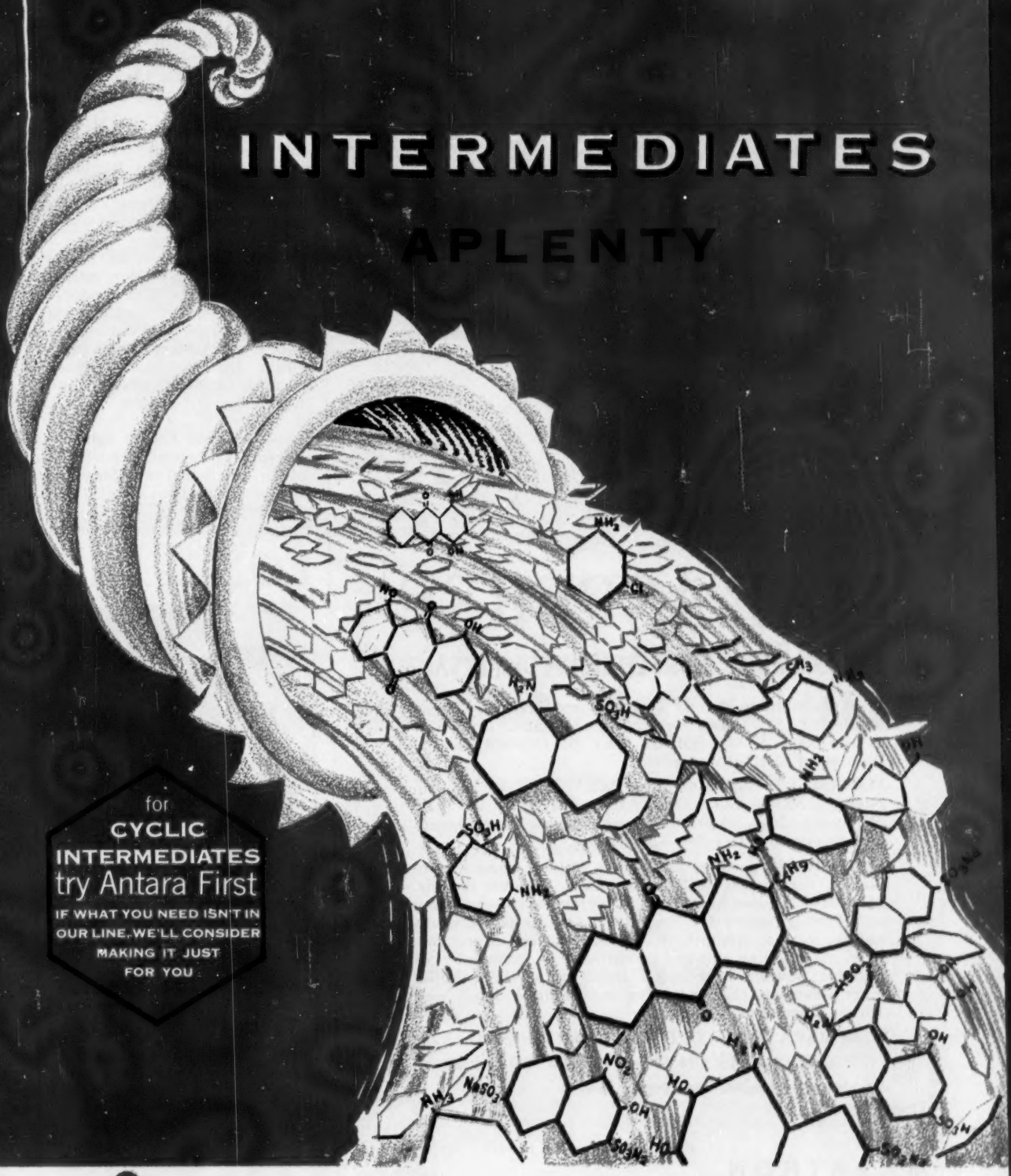
- All-metal, low-wing, single-place configuration; 450-hp. engine.
- Thick wings with removable plastic tanks for spray-chemicals, capacity 250 gal.
- Fuselage hopper with 53 cu. ft. of space for dry chemicals.
- One-ton payload, good short-field performance, and good low-speed flying characteristics.
- Exceptional pilot visibility, and good pilot crash protection.
- Engine-driven spray system—noncorrosive plumbing routed externally.

One of the first airplanes developed for farm chemical use, the Ag-2 should prove to be an aid in effectively applying versatile agricultural chemicals.

•

Binder: Rohm & Haas is now selling an acrylic-type water emulsion for use

INTERMEDIATES APLENTY



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SPECIALTIES . . . .

as a binder for glass mats and molding preforms. Called Binder P-812, it is said to resist discoloration during drying and molding, and to form a hard, colorless thermosetting polymer.

•

Pipe Joiner: Plasjoin VC is the new ready-to-use cement for polyvinyl chloride pipe, made by Merritt Products Co. (Cleveland). The compound is said to set rapidly, give a leakproof tough bond to rigid pipe.

•

Versatile Cloth: Lowndes Products, Inc. (Greenville, S.C.) now markets a cloth designed to fill the price gap between inexpensive disposable paper towels and expensive chamois. It is made of cotton fibers bonded together with a Chemigum Latex Purpose: to be used for dish washing, dusting, waxing. Name: Co-Sham.

•

Growing Room: For its agricultural chemicals, Thompson-Hayward Chemcal Co. is erecting a $57,000 warehouse in Kansas City, Mo.

•

Coupons Up: Twice the rate for soap

WIDE WORLD

Touch Up

PAINTMAKERS found a bit of encouragement in the way Secretary of the Interior Douglas McKay relaxed on his holiday. Although now back in Washington, McKay spent part of his three-week vacation brightening up the fence around his beach home at Neskowin, Ore. In harmony with the "do-it-yourself" trend, he wields his own paintbrush.

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CHEMICALS FOR THE TEXTILE INDUSTRY

Stauffer CHEMICALS SINCE 1885

With the progress of synthetic fibers the textile industry has been one of the fastest growing chemical-consuming industries in the country. The combined production of synthetic fibers alone is estimated at about 160 million pounds for 1953. New plants in new areas are creating increased demands.

Stauffer has tank car quantity supplies of carbon bisulphide, caustic soda, sodium hydrosulphide, sulphuric acid, chlorine and other textile basic materials, which can be delivered with speed from plants located in areas convenient to textile manufacturing. In fact, *eight* carbon bisulphide plants mean that Stauffer gives you the advantage of several sources for rapid deliveries.

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North Portland, Oregon • Weslaco Texas

SPECIALTIES

coupons will now be paid to grocers by the "big three" soap companies. These firms have agreed to pay retailers 2¢ per coupon redeemed—a move cheered by the retailers.

•

One-Season Lube: K-2 Protective Compound, an all-weather grease for automotive maintenance, has been developed by Jill Manufacturing Co. (Revere, Mass.). Based on GE's SF-96 silicone fluid, the new grease is particularly suited for use on door weatherstrips, hood lacings, and similar rubber parts that might squeak if not lubricated.

• Another silicone has been put to work on another sort of job. In a special liquid for photographic use, a GE silicone is used to eliminate minute scratches and to clean 35-mm. film negatives. It's recommended for use with a special device built by Simmon Bros., Inc. (Long Island City, N.Y.)

•

Glass Colorant: Foote Mineral Co. (Philadelphia) is now selling a new ground manganese sulfide glass colorant. Claim: it gives a clear amber tint superior to that of iron-sulfur-carbon colorants.

•

Neoprene Sticker: Carboline Co. (St. Louis) has a new industrial adhesive called Neoprene Adhesive F-1. No accelerators, catalysts or two-part mixing are required. The glue is said to adhere to a wide variety of products —metals, wood, concrete, rubber, glass, plastics. F-1 is not a vulcanizing type of adhesive.

•

New Home: Rego Laboratories, consultant in the chemical specialty field, has opened new labs and manufacturing facilities in New York (150 Broadway). Rego manufactures under private labels.

•

Better Resin: Dow Chemical Co. is now selling a pair of new polyvinyl chloride resins designed for calendering and extrusion operations. Dow PVC-111-1 is for calendering, and PVC-111-4 is for dry blend extrusion. Properties: good heat stability and low gel count.

•

Bulletins: How to make permanent photographic reproductions on anodized aluminum plates, using standard darkroom techniques, is described in the latest bulletin from Metalphoto Corp., Cleveland.

• Corrosion hasn't a chance, according to the descriptions of resistant mortars made by Delrac Corp., Watertown, N.Y.

• Also with an eye on corrosion is Furane Plastics, Inc., Los Angeles. Furane has issued bulletins on its resins for coating concrete tanks (Jet Kote) and on its X-2, for troweling floors.

• Grasselli Chemicals Dept. of Du Pont, with nod to the Kinetic Chemicals Dept., has a new brochure on the use of 90% technical methoxychlor oil concentrate in aerosols and fly sprays.

•

• Velsicol Corp. (Chicago) has just published an 8-page booklet on the use of Chlordane for controlling ants in home and garden.

Wound Deodorant: There's a new product from Airkem, Inc., the firm best known for its chlorophyll deodorant, Airwick. Top-O-Chlor is the latest development—it's a wound dressing in a neutral petrolatum base designed for deodorizing carcinoma, abscesses, etc. It is said to be nontoxic from the acute oral toxicity viewpoint, and is not a primary irritant. Currently, 4-oz. and 5-lb. jar sizes are featured.

•

New Forms: Three new forms of the "tranquilizing" drug, reserpine, are now offered under the Ciba tradename, Serpasil. Tablets, elixir, and ampuls have been developed. They're sold to aid in lowering blood pressure, slowing heart rate, and generally relaxing the patient.

•

Evaluation: For evaluation of automotive products, Gulf Oil Research and Redevelopment Co. (Harmarville, Pa.) is planning a new laboratory, fuel blending building, and boilerhouse addition.

•

Joint Filler: Newest of the paving joint fillers designed for jet airfields are Polyloid JFR Hot Melt Solids and JFR Cold Pour Compound, made by Grems Mfg. Co. (Klamath Falls, Ore.). Described as "modified thermoplastic elastomers," they are formulated to make a tough, rubbery mass when poured in cracks in masonry.

They are resistant to jet fuel solvent action, and also chemicals. The hot melt type can be heated in regular equipment without danger of overheating, the maker claims.

•

Colorants: For latex paints, Sherwin-Williams Co. (Chicago) is now selling a line of pigments. For manufacturers use, the pigments are simply stirred in, the maker says, and will not settle out easily. They are compatible with butadiene-styrene, polystyrene, acrylic, and polyvinyl acetate latex paints. Colors enough to meet the "*House & Garden*" suggestions are offered.

CHEMICAL PROCESS NEWS

PUBLISHED BY CHEMICAL PROCESS DIVISION, THE M. W. KELLOGG COMPANY

NOTES ON SYNTHOL

Synthol is the name of the Kellogg-developed process for catalytically reacting synthesis gas (carbon monoxide and hydrogen) to produce a wide variety of hydrocarbon materials and chemicals. Synthesis gas for the process can be derived from either natural gas or coal.

* * *

The first plant to utilize Synthol on a commercial scale is now under construction by Kellogg in South Africa. Partial combustion of coal (from vast deposits near the plant site) will form the source of the synthesis gas; primary products of the plant will be "petroleum" fuels—around 60 million gallons per year, of which the major part will be motor gasoline.

* * *

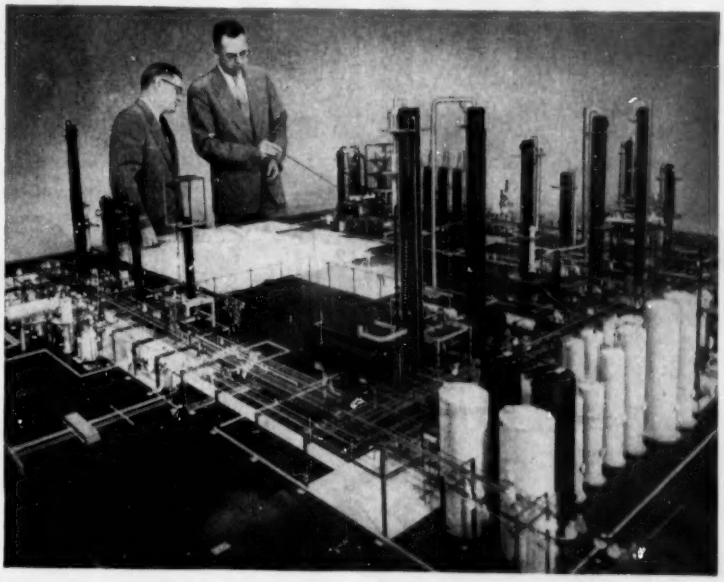
In addition to gasoline and fuel oil, the plant's output will include an impressive quantity of industrial and agricultural chemicals—about 125 million pounds. Many of these are oxygenated compounds, produced as by-products in the Synthol unit. While their volume is small in comparison with the enormous amounts of fuels produced, the higher market value of these chemicals adds substantially to the over-all attractiveness of the Synthol process.

* * *

The water-soluble or chemical stream from the Synthol unit is passed through a series of operations involving both extractive and conventional distillation to separate methanol, anhydrous ethanol, methyl ethyl ketone, and acetone. The methanol will be used as a solvent in the process and the ethanol will be blended into the gasoline pool. The other two chemicals will be marketed.

* * *

Additional equipment is being installed to produce commercial grade propanol and/or butanol, or to further process these products as additional gasoline.



Low Production Costs, High Yields and Flexible Operation Characterize New Phenol-from-Cumene Process

Shown above is a detailed model of a unique chemical plant Kellogg is currently building for Hercules Powder Company at Gibbstown, N. J. The plant will produce phenol, acetone, and methyl styrene, using the Hercules-Distillers process for oxidizing and splitting cumene. Kellogg, which developed the mechanical design of the commercial process in collaboration with Hercules, is also the originator of the process to be used for making the cumene feed.

The over-all process offers an unusual example of how refinery products can be upgraded to industrial chemicals to obtain a radical increase in value.

The phenol portion of the output is derived from the benzene part of the initial input. In the same way, the acetone produced is attributable to the low-cost propylene third of the feed.

As compared with other processes, the latter product—acetone—at present prices provides a bonus for the phenol produced as a major product. Moreover, the comparatively small quantity of methyl styrene produced can be separated for use in the plastics industry, or it can be converted back to cumene and re-used in the process.

For further information, technical data, etc., relating to chemical or petrochemical processing, write

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with your assurance of satisfaction in advance.
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"PROBLEM PRODUCT" PACKAGING
specialists to study your requirements.

INDEPENDENT PROOF THAT THE SACKS THAT PROTECT YOUR PRODUCT ARE CONSISTENTLY THE BEST THAT MONEY CAN BUY

Users long believed that Hudson Multiwall Sacks offered the surest, safest protection for their products. To prove it we went to the independent testing service, The U. S. Testing Company, asked them to find out.

To make their comparisons, U. S. Testing buys in the open market samples of Hudson Multiwalls, along with sacks of other manufacturers — tests them by standards far more severe than the toughest service they'll ever get in actual use.

The result: of all multiwall sacks tested, only Hudson received the coveted Seal of Approval. And note that this testing is continuous . . . new tests are made *each* month. The U. S. Testing Seal, found only on Hudson Multiwalls, is your proof that Hudson sacks are *regularly* tested and certified for performance.

For you: this means you can now assure your customers that your products receive the same fine quality control from raw material to *delivered* product. You can show dramatically with the Hudson Multiwall Seal of Approval that product, production and packaging are consistently the best money can buy! Your Hudson representative can give you the details behind "certified" performance!

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CW-9

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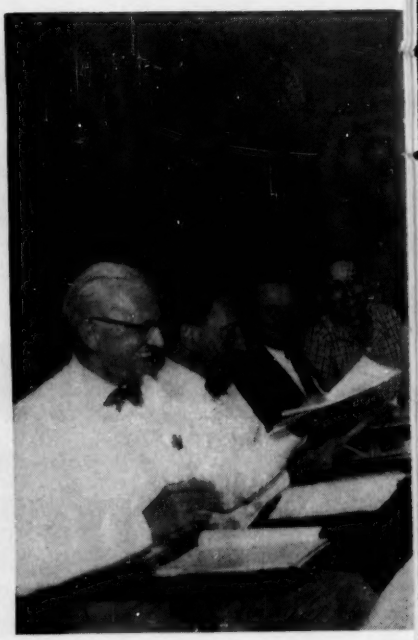
BACK TO SCHOOL: U. of Louisville's Woodrow Strickler (r) greets Devoe's Harold Kolseth.



D&R's senior sales executives . . .

Sales Executives Sharpen Their Wits

Last week, one company pioneered what may be a "first" in grappling with sales management problems, at least as far as the chemical and allied industries are concerned.

Reversing ancient Thales' dictum, "Know thyself", 200-year-old Devoe & Raynolds Co., Inc., made a point of deliberately stepping outside its own field in search of knowledge, focusing on marketing and sales studies in virtually noncompetitive fields.

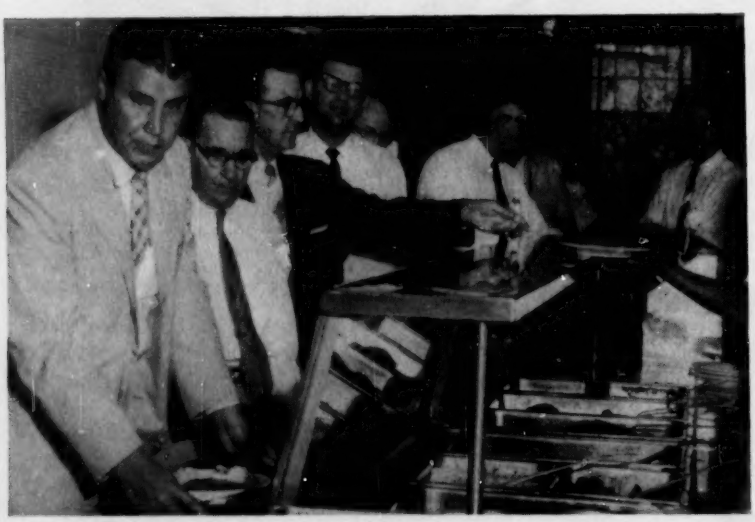
Gathered from all parts of the country, 22 of Devoe's top sales executives assembled at the University of Louisville, and, for a solid week, pored and mulled over case histories of pharmaceutical, electrical, carpeting, linoleum, brewing, asphalt and rubber tile, farm and auto equipment companies—practically all, in fact, except the paint field.

The purpose of this seemingly diverse education? A fresh viewpoint. As Devoe Executive Vice-President Harold Kolseth phrased it: "We believe that a knowledge of the sales pictures of firms in other businesses will give our own executives a fresh viewpoint on their own problems.

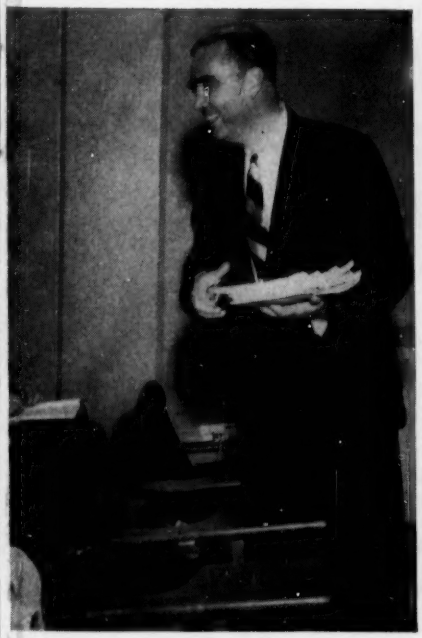
"There's a common sales denominator in the marketing of all products. We believe that a study of other industries will stimulate the vision, imagination and ingenuity of our people in making a practical analysis of the actual sales management problems they face each day."

Yearling: Kolseth did not arrive at the contents of his management seminar overnight. If a date can be set, the idea for the forum germinated about a year ago. At that time, the company sent several key men to Rutgers for concentrated "broadening" in finance, production and other courses outside their specialized operations.

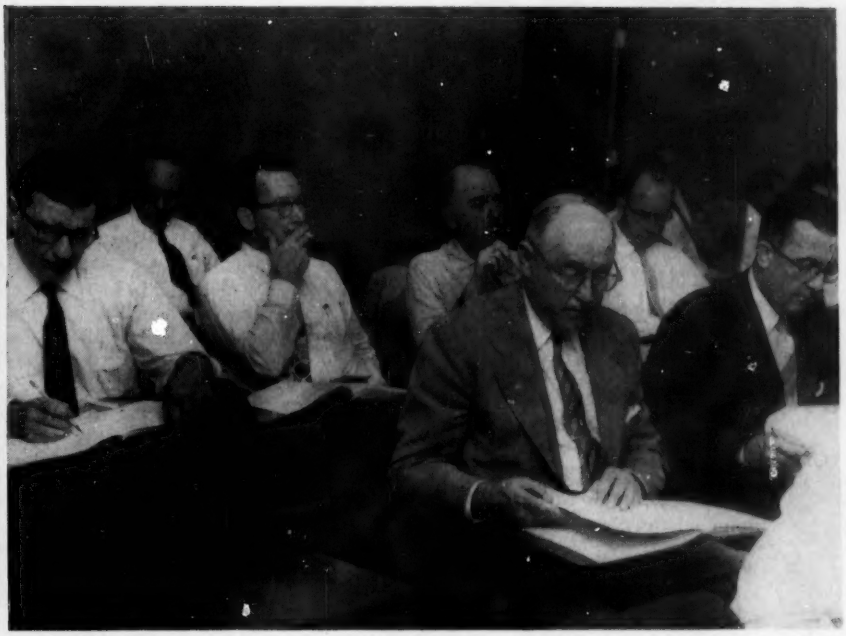
"And although," as Kolseth sizes it, "such courses are good, their value is limited to the number of men who can be spared from their duties to attend them."



QUICK LUNCH: Daytime hours saved, evening hours are lengthened for study.



. . . receive study assignments . . .



. . . buckle down to a full week of intensive study of marketing and sales management problems.

The forum attended by last week's group had been six months in the active making. Early in its preparation, it was limited in scope to three company objectives:

- An analysis of currently successful methods in the selection, supervision, and training of salesmen.
- The utilization of effective sales management techniques on a given sales objective.
- Reduction in distribution costs—not by arbitrary reduction of necessary elements, but by carefully appraising expenditures in the doubtful or unproductive categories, singling them out, and eliminating them.

The 'Case': Around that framework of three objectives, Kolseth and his staff accumulated a wide range of business problems, or "cases." The case method, as informally defined by Kolseth, "is no more or less than the route we ordinarily use in reaching an answer to our daily problems. But in our discussion sessions a leader is present—solely to maintain an orderly thought process that enables the assembled group to reach conclusions from known facts."

"The secrets of the success of the method," he continued, "are threefold":

- "It allows us to be entirely objective and without bias in expressing our views and recommendations.
- "We see, by studied analysis, that all sales problems are basically of the same character.
- "We obtain the advantages of 'group thinking' in reaching our conclusions."

The number of cases actually discussed by the group at Louisville had been narrowed to 16—the "cream" of more than 100 separate business problems that had been reviewed by Kolseth's staff.

The Handpicked: In selecting the final 16 cases, three major qualifications were assessed:

- Consumer industries with basic problems similar to those facing the paintmakers' sales executives were particularly desirable.
- Only "live", or recent, cases were included, thus avoiding "theory" or "text" principles. In some instances, the choice had the added value of permitting the group to learn how the "case" company attacked its own difficulty, and the degree of success it attained.

RAISING A POINT: Case method, unlike formal classes, encourages argument.

zinc dust as a reducing agent

Offers these advantages:

1. Original cost is lower than most commonly used agents.
2. Works in alkaline and acidic solutions of varying pH; also in aqueous and alcoholic solutions.
3. Yields a salable zinc by-product.
4. Effective in both organic and inorganic reactions.

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. . . is the country's largest producer of Zinc Dust, with plants at Trenton, N. J. and Sand Springs, Okla. We maintain extensive research facilities which permit us to give you active help on your particular problem. Our particle size control should allow us to fill your specific requirements.

Produced under rigid physical and chemical control, Federated Zinc Dust has 97.0% minimum metallic zinc content; iron content .01%, lead .20% maximum. It will all pass through a 100 mesh screen; 97.0+% through a 325 mesh screen.

Free Sample

You can have a free half-pint sample of Federated Zinc Dust for testing as a reducing agent. Just write on your company letterhead to Dept. CW at address below. Investigate it, too, as a catalyst and as a polymerizer.

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American Smelting and Refining Company
120 Broadway, New York 5, N.Y.

• No paintmaker's problems were touched upon. Reason: the discussion, by not including possible Devoe home problems, could be totally objective, involve no personal feelings.

In fact, only once during the week-long session did the group hear about paints. On the fourth day, the participants got a "breather", spent the day listening to Titanium Corp.'s Fred Stieg, Du Pont's W. E. Lusby, and J. Walter Thompson's Virgil Reed discourse on "chemical and market horizons" in the paint industry. This sole departure, explained Kolseth, was planned to illustrate how cases in other industries might find application in paint selling.

No Exams: During the four days' discussion, no examinations nor quizzes were given. However, in terms of rating, the company feels at least two types of results accrued:

• It enabled members of the sales divisions' middle management (the forum group) to pit their knowledge and business judgment against each other.

• It gave top management an opportunity to appraise the members of the middle sales group in action.

Outlook: Kolseth adds: "We looked on this case method study as an experiment and were quite pleased with the results.

"Our forum will, we hope, begin a new trend—similar to the one already established by many corporations, the practice of sending a few of their key personnel to attend business administration classes at universities."

And as for Devoe, itself—although as yet no definite plans have crystallized, the company is already considering extending the same method to its financial, production, research and other groups.

A "Case" of Beer

So that its readers could better appreciate the "case" method, as studied by Devoe & Raynold's sales forum (*pp. 72 and 73*) CW persuaded Devoe's management to select a business problem from the set it actually used. Curiously, the case selected, a brewing industry example, embodies several conditions that parallel the current status of the paint industry. This similarity of conditions, however, Devoe emphasized, is not a necessary qualification for a suitable case study.

Somewhat abridged (and with company identification removed), this is a problem in the "selection of major marketing areas by a national manufacturer" that Devoe's forum members tackled:

MAJOR CO., INC.

A. Industry Position

The brewing industry, historically, has enjoyed gradually increased demand over the course of years, in almost direct proportion to population growth.

The industry, consisting of a large number of family-owned enterprises, has been able to operate successfully on a local basis (like paint) having small freight costs. Larger companies, endeavoring to distribute nationally, have been under a freight cost disadvantage. Failing in local competition, some brewers endeavored to capture the most highly populated markets by intensive advertising of "premium beer."

Profits for the industry generally had been declining steadily since 1949, the less efficient brewers driven out of business, their markets already absorbed.

B. Action taken by Major Co., Inc.

As early as 1951, the company undertook a program of decentralized production. With its main plant located in the Midwest, it:

• Completed plants in New Jersey and California.

• Planned a brewery in Louisiana.

And, in another move, the company recently slashed its "premium beer" price to meet local competition.

Questions:

1. How far can a national manufacturer go in steps such as Major Co. has taken to meet and compete with firmly established local producers?

2. Evaluate and comment on the successive steps taken by the company, including the price slash. Was this necessary? Why—or why not?

3. Comment on effect on Major Co.'s plans resulting from (a) a strong Western brewery's expansion plans for the Eastern market, and (b) a successful Eastern firm's announced West Coast expansion.

Cyanamid's

No. 8 of a series of advertisements

ACRYLO-NEWS

AERO* Acrylonitrile, a highly stable bi-functional chemical, is finding increasing use as a reactive intermediate. Its versatility is indicated by its use in the preparation of pharmaceuticals, insecticides, surface active agents, and many other useful products as well as by direct application in the broad fields of rubber, plastics and textiles. Its polymers and copolymers can be formulated to add many desirable properties to today's products and to create interesting new products for the future. The following items and abstracts, gathered from many sources, indicate a few facets of current research with this versatile chemical.

☆ ☆ ☆ ☆ ☆ ☆

REACTING ACRYLONITRILE WITH STARCH YIELDS CYANOETHYL ETHERS, useful as textile and paper sizes, protective colloids, thickeners, dispersing agents and other processing aids. Many compounds with a free hydroxyl group can yield extremely interesting properties by effecting a relatively small degree of cyanoethylation. In addition, the nitrile group may be modified in a number of ways to synthesize many new compounds.

COLOR STABILITY OF POLYMERS AND COPOLYMERS OF ACRYLONITRILE is greatly improved when small amounts of cyclohexanone are added to dimethylformamide solutions of these polymers. Films cast or filaments spun from these solutions are capable of being stretched up to 600%.

Cyanamid's OXY-, IMINO-, AND THIO-DIPROPIONITRILES show high selectivity for the separation of aromatic from aliphatic hydrocarbons. Aromatic fractions of extremely high purity are obtained. Compounds having only slightly different degrees of saturation may be separated by fractional partition between one of these nitriles and a paraffin.

IF ACRYLONITRILE IS CONTACTED WITH A MONO-SUBSTITUTED DIHALOPHOSPHINE and slowly polymerized in the presence of an azonitrile, the phosphorus-containing products are heat-resistant, and useful as flame-proofing agents for textiles, molded articles and films.

AN ACRYLONITRILE-VINYL CHLORIDE COPOLYMER can be formed into shaped articles characterized by high impact strength and softening temperatures. Films, foils, rods, tubes, bottle caps and bands are rendered insoluble, heat-resistant and flexible by the incorporation of the precondensate of a cross-linking resin such as melamine-formaldehyde.

(Some or all of the above items are covered by U.S. or foreign patents)

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Should you wish a more complete bibliography of current literature and new developments concerning acrylonitrile, we shall be glad to place your name on our mailing list.

As the pioneer producer of this exciting vinyl monomer, American Cyanamid has expanded its production facilities to assure users adequate supplies at low price. Write for technical assistance in your acrylonitrile research.

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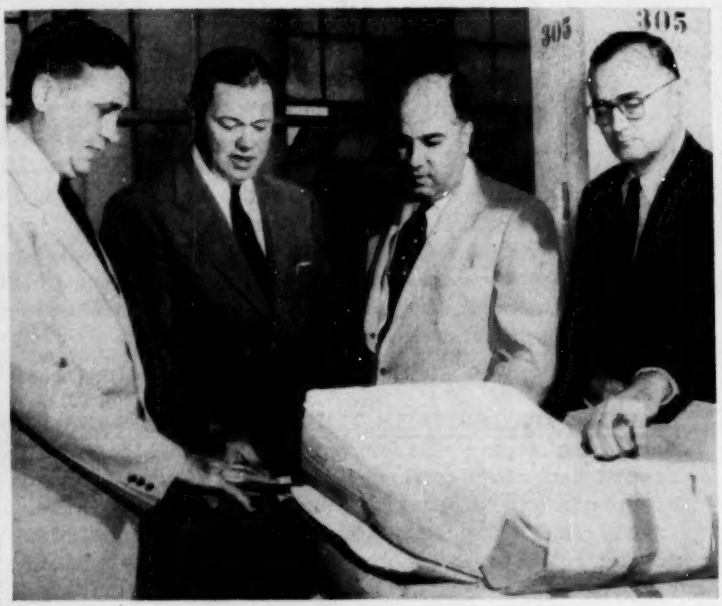


Wrap for Rubber

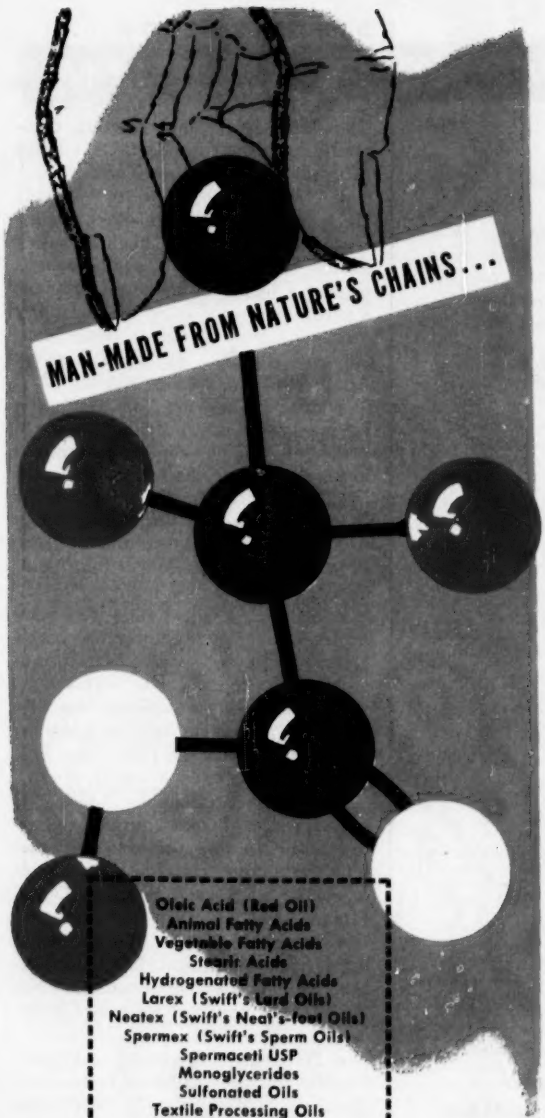
SYNTHETIC RUBBER packaging, long a problem, could be in for revamping if present studies at the Firestone Tire & Rubber Co. prove advantageous. Above, government and Firestone officials* are inspecting shape-retention results of one potential prospect, a new cardboard box.

Current paper bag wrapping, assert the experts, isn't "completely satisfactory." Although paper bags meet some requirements, both government and industry seek a container meeting these criteria:

- It must store rubber for extended periods without altering the rubber's shape or adhering to it. Additionally, it should unpack efficiently.

Time-and-motion study, shown below, is an essential part of the research. Although some data are yet to come, one federal official says "the new box shows great promise."

(L. to r.) Henry Kohler, Jr., Office of Synthetic Rubber; James W. Maples, Firestone; E. D. Kelly, OSR; and J. C. Roberts, Firestone.



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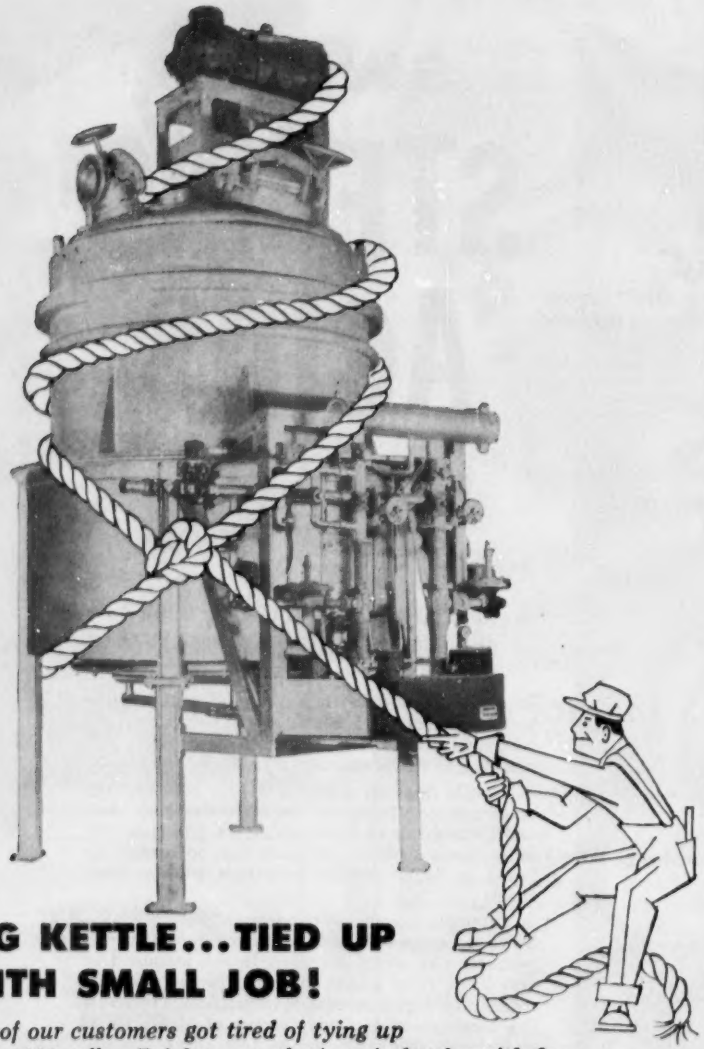

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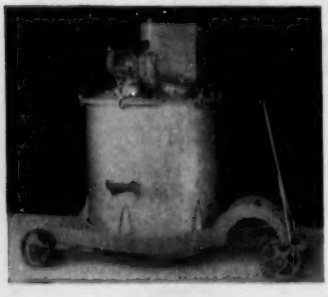

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• "How Manufacturers' Agents Help Small Businesses"—leaflet, discusses the outlets manufacturers' agents offer to small firms, weighs merits of agent distribution, provides a check-list for anlyzing the feasibility of manufacturers' agents' use. Management Aid No. 50. Small Business Administration, Washington 25, D.C.

• Problem Solving and Marketing Science—booklet, considers the application of problem solving techniques to marketing. Included in the contents: Functionalist View of Market Behavior; Function and Structure in Competition; Science and the Ultimate Problem. American Marketing Assn., Chicago.

• Halowax Product 4004—technical leaflet, delineates a chlorinated paraffin extender and typical uses in formulation. Bakelite Co., New York.

• Modernizing with Glass—suggests ways of increasing use of glass in homes. Libbey-Owens-Ford Glass Co., Toledo.

• Glacial Methacrylic Acid—14-page technical booklet, provides physical and handling properties, availability, reactions, possible uses. Rohm & Haas Co., Special Products Dept., Philadelphia.

• Ethylene Glycol—11-page booklet, furnishes technical data, specifications, suggested applications. No. F-8327 Carbide and Carbon Chemicals Co., New York.

• "Hydrofol" Products — 40-page booklet, provides technical facts, specifications, potential uses of fatty acids, alcohols, glycerides and sperm oils. Archer-Daniels-Midland Co., Chemical Products Div., Cleveland.

• Anticorrosion Coatings—Catalog lists rubber coating products and potential applications. Magic Chemical Co., Brockton, Mass.

• American Potash & Chemical Corp., Los Angeles, offers a catalog containing descriptions of all its products.

• Plastolein Plasticizers — a technical brochure presenting physical data, suggested applications, and test methods for 7 plasticizers. Emery Industries, Inc., Cincinnati, O.

• Moly Spray Kote—leaflet provides specifications, applications, and application procedures. Alpha Corp., Greenwich, Conn.

• Consumers' buying habits of the Appleton, Wis., area—contains fundamental population, housing, shopping, and reading habit information, and

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β - Dimethylaminoethyl Chloride Hydrochloride. (DMC). $(CH_3)_2 NCH_2CH_2Cl \cdot HCl$. A granular solid. Specially prepared for use in manufacture of antihistaminics and other pharmaceuticals. Other potential uses in organic synthesis. Relatively non-toxic in Hydrochloride form.

β-Dimethylaminoisopropyl Chloride Hydrochloride. $(CH_3)_2NCH_2CHClCH_3 \cdot HCl$. (DMIC). An organic intermediate similar in appearance and properties to DEC and DMC. Specially prepared for manufacture of analgesics and other pharmaceuticals. Other potential uses in organic synthesis.

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customer brand-preference breakdowns for many consumer commodities. No data on purchase volume. Appleton *Post Crescent*, Appleton, Wis.

• Increased Profitability Through Better Packaging—68-page ($1.25) booklet presents policies of some companies on point-of-sale packaging, research, and the development of the job of packaging executive. Packaging Series No. 44, American Management Assn., New York.

• Glycols and Related Products—72-page booklet furnishes technical data and background on several glycol-based chemicals, Wyandotte Chemical Corp., Michigan Alkali Div., Wyandotte, Mich.

• Polypropylene glycols intermediates for alkyd-type resins and emulsifying and wetting agents—4-page technical leaflet describes potential applications, technical data, and specifications. Carbide and Carbon Chemicals Co., New York.

• Wool bleaching—16-page booklet supplies technical information on the hydrogen peroxide bleaching of wool and other fabrics. E. I. du Pont de Nemours & Co., Wilmington, Del.

• Propylene oxide—4-page leaflet contains specifications, technical data, and suggested applications. Carbide and Carbon Chemicals Co., New York.

• Columbian Carbons in Natural and Synthetic Rubbers—provides extensive physical data on rubber compounding. Only a limited quantity is available; the firm requests that only rubber compounders and carbon black specialists solicit copies. Binney & Smith Co., New York.

• Shell Molding and You—25-minute sound slide film delineates the advantages of shell molding over other casting methods. General Electric Co., Chemical Materials Dept., Pittsfield, Mass.

• Polystyrene Plastic-Styron 647—booklet offers data on fabrication, finishing, properties, and potential applications. Plastics Sales Dept., Dow Chemical Co., Midland, Mich.

• Polystyrene cleaner—technical data sheet, "Poly-Kleen," outlines methods of cleaning polystyrene sheeting without crazing. Schwartz Chemical Co., New York.

• Distilled Monoglycerides as Alkyd Resin Dispersants—technical booklet supplies physical data and application suggestions. Distillation Products Industries, division of Eastman Kodak Co., Rochester, N.Y.

• Hydrocarbon catalog—fourth edition, lists numerous petroleum-derived hydrocarbons, specifications, physical properties, shipping information and prices. Phillips Petroleum Co., Special

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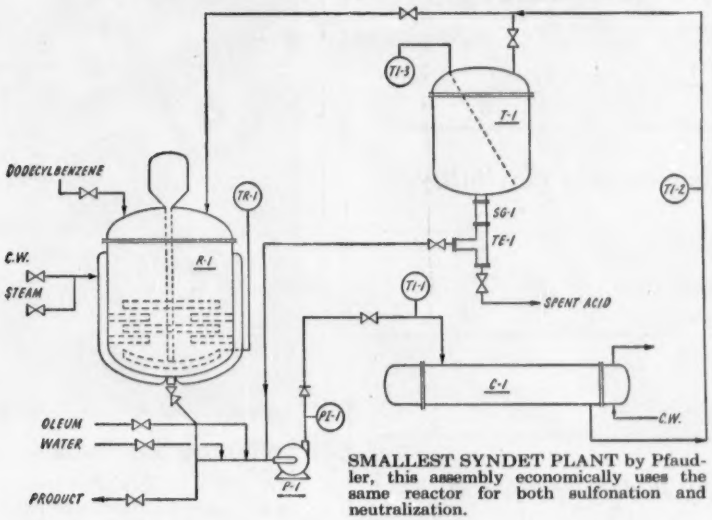

SMALLEST SYNDET PLANT by Pfaudler, this assembly economically uses the same reactor for both sulfonation and neutralization.

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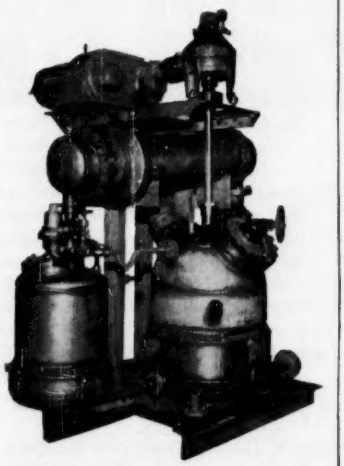

INCONEL was used in this assembly for solvent recovery. See article (right).

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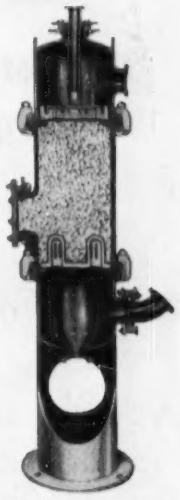

They said it couldn't be done. They said every glassed steel column had to be a custom job, built to meet the customer's special requirements.

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- Synthetic resins, pentaerythritol, plasticizers, and nonionics—technical bulletin provides physical data. Hercules Powder Co., Synthetics Dept., Wilmington, Del.
- Tanak-mrx leather improver—brochure details technical data, application methods, and suggested uses. American Cyanamid Co., Leather Chemicals Dept., New York.

Softening for Suds

WATER SOFTENER manufacturers may be inundated with sales soon if the debut of National Soft Water Week (Sept. 12-18) convinces hard water users of the costliness of their water. Designed to stimulate sales and use of water conditioning equipment and services, the "Week" is under the sponsorship of the Water Conditioning Research Council. Assisting: some 3,500 soft water service operators and equipment distributors.

"Soft Water Week," asserts the Council, "will spotlight facts . . . which have a direct application in dollars and cents savings." Aimed at consumers and industrial water users, the campaign will promote soft water with such arguments as:

- American housewives spend $550,000,000 annually in excess amounts of detergents and soap. Water with a 10-grain hardness (U.S. average) raises cleaning costs $24/year for the average family of four.
- Hard water costs industry "millions of dollars" in maintenance necessary to clean clogged pipes and scaled boilers.

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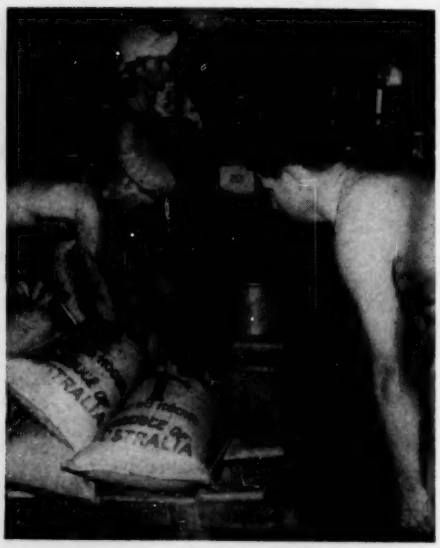
OPERATOR (left) sifts rutile, finished product of mining operation, which starts with bulldozer (right) plowing up the beach.

Bonanza in the Beach Sands

Against a backdrop of blue sky and ocean breakers, Australian mining companies this week are busily churning up beach sands. For beneath the overburden of crisp, white silica lie rich deposits of black minerals containing rutile—one of the principal sources of titanium pigment and titanium metal.

And thanks mainly to the emphasis that the U.S. is placing on production of titanium metal, the beach sands business promises to turn into a regular bonanza. Last year, Australia was able to supply 42,854 tons of rutile—enough to make 21,000 tons of the metal. About half of the exports ended up in this country.



AT THE PLANT, rutile is separated (left), packaged for shipment (right). Australia exported 20,549 tons to U.S. last year.

MINERAL sands are loaded onto cars for shipment to the treatment plant.

The principal Australian sources are found on ocean beaches extending 50 miles and crossing the Queensland-New South Wales border. Actually, the black sands are found along a 400-mile stretch of coast, but only along the 50-mile strip are they considered high enough in rutile for economic recovery. Proved reserves total close to 2.5 million tons, 750,000 tons of which is rutile.

At one time, the U.S. depended largely upon Indian ilmenite as a titanium source. Presently, Du Pont, one of the two big producers of titanium metal, works off Florida ilmenite mined by the Humphreys Gold Corp. And it's about to resume some earlier trials on the titanium-rich slag produced by the Quebec Iron and Titanium Corp.

The other big producer, Titanium Metals Corp., gets all its raw materials from Australia. Although National Lead, one of the owners of Titanium Metals, has large reserves of ilmenite in the Adirondacks region of New York, all the production there is used to supply the firm's titanium dioxide plant at Sayreville, N.J.

Grown to 10: The first Australia mining operations got under way just after the war. Now there are 10 companies—all working in the area between Stradbroke Island (just east of Brisbane) and Byron Bay, 30 miles south of the border in New South Wales.

The mining operation itself is simple. A bulldozer or mechanized scoop and a diesel-operated dragline load the ore onto trains or trucks. But the operations become more complex when the ore reaches the nearby treatment plant.

At first, the black sands were merely separated from the silica, then bagged and shipped. The product then contained sizable amounts of zircon and ilmenite in addition to the rutile. That meant relatively high freight costs.

Now the modern Australian plants make a complete separation of the three minerals. Some use magnetic separators first; others start with an electrostatic separation.

There is no established market for Australian ilmenite; because of its relatively huge chromium content, it isn't suitable for titanium production. But the nation shipped 26,864 tons of zircon in the last fiscal year for which figures are available.

Since the rutile, ilmenite and zircon are about twice as heavy as the silica, the initial separation of the black sends is a cinch. It's carried out on vibrating screens that reject the lighter material.

Separating the minerals in the black sands is a more difficult job because there is only a slight difference in the specific gravity of the three: zircon, 4.5; rutile, 4.4; ilmenite, 4.2. In plants employing electrostatic methods as a first step, the concentrate is fed by conveyor into a 40-ft. rotary kiln drier. There, the water is driven off and the material is brought up to the proper temperature, which is critical.

As the heated concentrate passes through the separation plant, a charge is imposed upon it. That repels the zircon fraction, which is collected on rubber rollers. The remaining rutile-ilmenite fraction is split in a magnetic separator.

Traveling Lake: The Australian methods are essentially the same as those used by Humphreys Gold in Florida. The latter mines ilmenite on Trail Ridge, 6 miles east of Starke.

The white overburden removed from an area about a half mile long and 500 ft. wide forms a black "lake." A dredge and separators floating on the lake pick up the sand in front, take out the black ore and pour the sand back into the lake behind them. Thus the lake is constantly moving forward and the method has been identified as the "traveling lake."

The sand is pulled up by a 20-in. suction dredge and pipe directly to a floating scrubber barge, where the organic coating is removed and the heavy, black mineral is separated from the white sand in the Humphreys spirals.

While the white sand is being returned as back fill, the ore concentrate is piped to a mill, where the ilmenite is concentrated by electrostatic and magnetic separators.

In the Canadian venture of Quebec Iron and Titanium (owned two-thirds by Kennecott Copper, one-third by New Jersey Zinc), the ilmenite is mixed with coal and then charged to an electric furnace. The normal process of smelting titaniferous ores calls for the addition of large quantities of fluxes—like lime, soda or alumina. The fluxes are added to counteract the thickening of the slag caused by the presence of lowered-valenced oxides of titanium. But they also dilute the slag, make recovery of titanium from it economically unattractive.

But the Canadian firm uses a unique process (*CW, Oct 11, '52, p. 39*) that minimizes the use of flux, thus turns out a high-titanium slag.

With the U.S. interest in titanium rising high, it's likely that all three sources—along with others—will take on a bigger role.

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RESEARCHER FASKEN: The scale-up is in sight.

Titanium in Cells

Among the Commonwealth nations, interest in titanium isn't confined to raw material processing (see preceding story). Shawinigan Water and Power Co. (Montreal) created quite a stir last spring when it revealed that it had developed an electrolytic process for making titanium, that it had applied for a U.S. patent on it. What has been a well-kept secret: the firm has already received a British patent—No. 678,807—on such a process.

Shawinigan's work in titanium dates back to 1945, when it started experimenting with means of separating the titanium from iron in electric furnaces. That work, in fact, contributed to the establishment of Quebec Iron and Titanium.

And the research department, under the direction of N. R. Fasken, has continued its investigation in titanium. The electrolytic process that resulted hasn't convinced U.S. chemical men that it's the answer to titanium production problems. And members of the firm describe the pilot unit for the development as "somebody's poor plumbing" job. They feel, however, that it may pay a rich dividend.

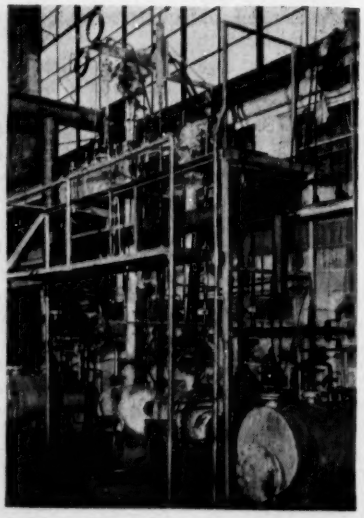
Shawinigan says the process has turned out high-grade titanium, that it believes the small unit can be scaled up to a continuous process that will make titanium at a cost appreciably lower than that made from present commercial units.

In the Cell: The British patent granted to Shawinigan cites the early Driggs patent (U.S. Pat. 1,835,025) for preparing metals of Group IV of the Periodic Table by electrolyzing a fused mixture of alkali halides to which is added a double halide of the desired metal. In it, the cathode is placed at or near the top of the fused salt.

The Shawinigan patent deals with the production of titanium (a member of Group IV) from the tetrachloride in a fused salt electrolyte. To keep the temperature of the mixture in the fused state as low as possible, Shawinigan points out, it's preferable to use more than one chloride of the group made up of sodium, magnesium, calcium and potassium. And to avoid the formation of the stable oxides and nitrides of titanium, the zone of electrolysis around the cathode must be isolated from contact with the atmosphere. It found, moreover, that a 10-50% excess of electricity was highly desirable. This was done either by adding the titanium tetrachloride at a rate slower than that required theoretically or by continuing electrolysis after all the tetrachloride had been added.

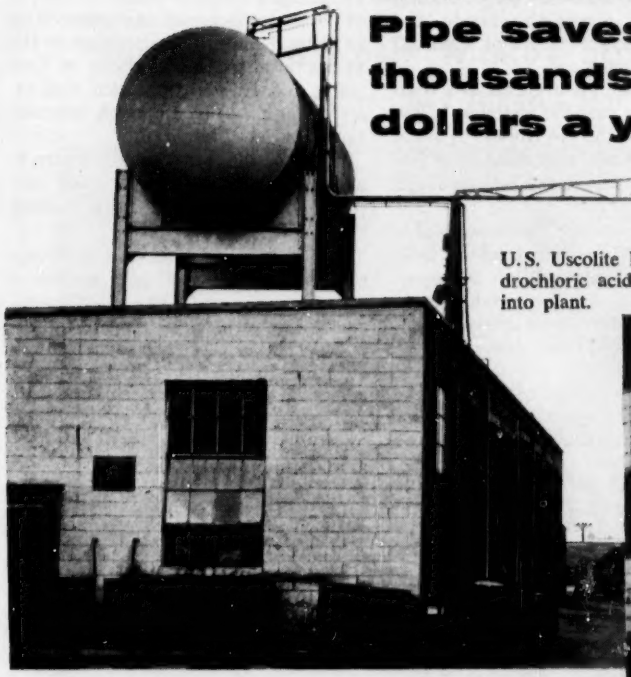
The cell employed in its preferred method was a circular one lined with a refractory. Next to the lining was an annular anode surrounding the electrolyte. In the center was a cathode separated from the anode by a metallic screen. (The screen impedes the flow of electrolysis products between the electrodes, prevents recombination as well as deterioration of the products.) A metallic chamber, electrically insulated from the cathode at the top and immersed in the electrolyte, had an inlet for introducing the tetrachloride.

In a typical trial run, the bath was made up of equal parts of sodium chloride and potassium chloride. Alternating current was passed through to fuse them and hold the temperature at approximately 1,250 F. Liquid titanium tetrachloride was pressured in from a container (by nitrogen) and the



TITANIUM PILOT: Rich dividend from poor plumbing.

New acid-handling system incorporating U. S. Uscolite Pipe saves thousands of dollars a year!



U.S. Uscolite Piping carrying hydrochloric acid from storage tank into plant.

Close-up of Uscolite piping and Hills-McCanna valves outside storage tank. The plant is in the background.

A large Eastern manufacturer of lighting and signaling systems uses 300 feet of Uscolite® plastic pipe to carry hydrochloric acid from storage tanks outside the plant across an areaway, and then through various production departments to final use in the plating room. Previously, carboys of acid had been used, because the plant had no facilities to store acid in bulk. But by installing a new acid-handling system, using U. S. Uscolite piping and fittings, the plant saves thousands of dollars a year—they now *buy and store in bulk*. Additional thousands are saved by reduced handling costs.

The plant also fabricated its own fume hoods from Uscolite sheet stock, for use in the plating operation. The plant engineer is pleased because Uscolite's unusual mechanical strength enables it to be left exposed in any weather, and to be run overhead through various parts of the plant without fear of damage to men or machines. Hills-McCanna Uscolite valves are used in the piping assembly.

Uscolite pipe and fittings are made in the broadest and largest line of stock sizes on the market.

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inlet vented to an atmosphere of argon. And as the tetrachloride was being introduced, a 7- to 8-volt direct current was applied across the anode and cathode, forcing a current of about 60 amps through the cell.

The titanium metal forms as a hard sponge in the cathode chamber below the surface of the electrolyte. A small portion, however, may form as a fine powder and settle to the bottom of the cell. The sponge portion can be leached with water to remove soluble salts, then divided into fractions held on 14-mesh screen, held on 200-mesh screen and passing 200-mesh screen. The coarse material was assayed highest in titanium, the fine material assayed lowest.

Commercial merits of the process are still to be proved. In any case, Shawinigan, with its abundance of power and access to Canadian raw materials, will be a factor to reckon with when assessing titanium's future.

Inorganics Abroad

From the Continent comes a number of patent applications and research reports on the latest developments in the inorganic chemical industries of Germany and Russia, translated and offered (for a fee) by Research Informations Service (New York).

Many of the translations are sure to arouse the interest of production people this side of the Atlantic. Among the reports:

• No. 95,995, Henkel & Cie. (Duesseldorf), which describes a process of manufacturing crystallized alkali metasilicate hydrates. According to the report, addition of specified substances to silicate melts results in accelerated crystallization, shortens required storage period before grinding, reduces sensitivity of ground product to atmospheric carbon dioxide.

• No. 95,991, Metallgesellschaft A. G. (Frankfort), which covers a

PVC on a Budget

SCIENTIFIC DESIGN CO., Inc. (New York) is plugging a series of package designs for low-budget polyvinyl chloride plants that would produce between 4 and 15 million lbs./year. Appraising one of the series' plant models, SD President H. Rehnberg (*see cut, right*) feels that it and its countertypes would be just the thing for the nation's nearly 500 small processors, many of whom are interested in turning out their own raw material.

At the moment, only one such PVC plant is in operation—it was built in Europe by a large European chemical manufacturer who codeveloped the process in collaboration with Scientific Design. A second* plant is scheduled for the U.S.; design contract has just been completed; and, says SD, the second plant will be larger, will have monomer facilities as well. For the PVC processing, both units will employ the suspension method.

* SD is engineering units for General Tire at Ashtabula, O.

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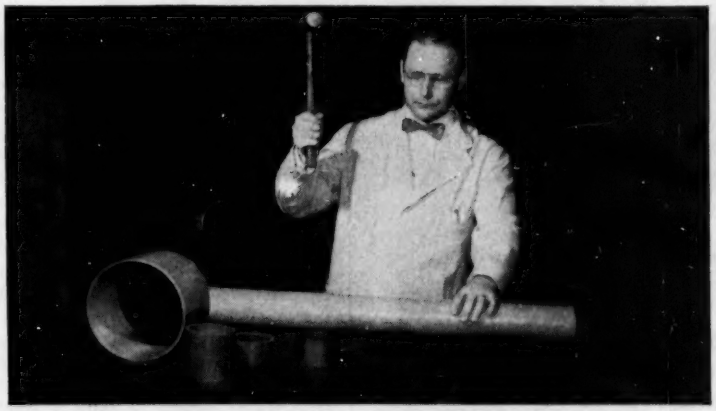

A smashing blow with a heavy sledge hammer fails to damage impact-resistant, glass reinforced laminates made with a new blend of Polyamide and epoxy resins.

Producers of glass laminates appreciate the new Polyamide-epoxy resin blends because they show physical properties superior to other thermo-setting materials.

These new resin blends have a natural affinity for glass, in either sheet or fiber form. This affinity helps wet the glass quickly and thoroughly, leading to fewer voids and a better bond of resin to glass. Their water resistance, too, is important to makers of glass reinforced plastic pipe or surface coatings for laboratory furniture and equipment.

Polyamide-epoxy resin blends are resistant to alkali and to a wide range of corrosive chemicals and solvents.

Laboratory test results have shown greatly superior impact strength, especially for the Polyamide Resin 115-epoxy resin blends. Polyamide Resins are non-volatile and have no unpleasant odor. Also, over a year of experimental work has been carried on with no toxic effects to personnel. Tests show that Polyamide Resin is practically unextractable by water or lard oil.

The low shrinkage of Polyamide-epoxy resin blends permits close conformation to the mold, with less tendency to crack during the curing cycle. Low exotherm and low shrinkage are properties which promise a bright future for Polyamide-epoxy blends in the potting and casting and in the tool and die fields . . . especially automotive and aircraft.

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Because of their excellent color stability and rapid baking qualities, Aliphats 16-A and 16-BW are also suitable for alkyd resins used as plasticizers in air-drying lacquers and enamels, and in baked finishes in conjunction with urea or melamine resins.

Typical composition of Aliphat 16-A is 55 per cent linoleic acid (91 percent oleic and linoleic) and of Aliphat 16-BW, 56 per cent linoleic acid (88 per cent oleic and linoleic).

If you would like more information on General Mills fatty acids, please mail the coupon below.

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Fatty Nitrogen Compounds became an even larger part of the General Mills chemical picture recently with the commercial introduction of two new fatty nitrogens—General Mills Alitrile 7 D and Alamide H 26.

Alitrile 7 D (distilled stearo-nitrile) and Alamide H 26 (hydrogenated tallow amide) are chemical intermediates in making textile finishes which impart durable water-repellency to articles such as hats, raincoats and play clothes. They also afford certain antistatic, wrinkle resistant properties; help improve the "hand" of the cloth.

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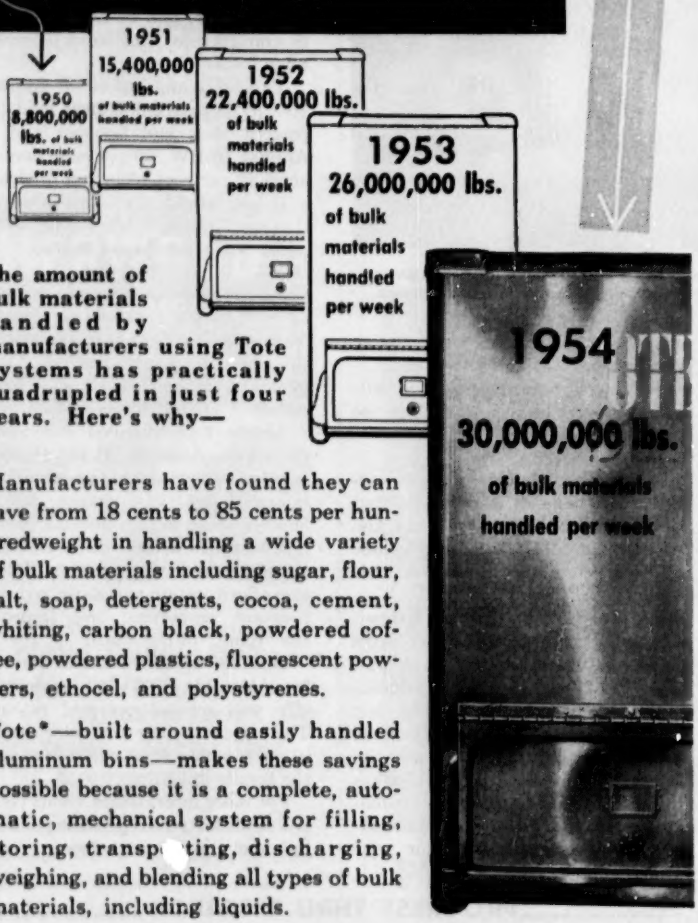
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PRODUCTION . . . .

process of increasing conversion in the production of sulfuric acid by the contact process. As well as the increased conversion, relates the report, this process offers a saving in contact mass, avoidance of local overheating, and elimination of production stoppages.

• No. 95,996, Chemische Fabrik Budenheim A. G. (Budenheim), which details a process of producing technically pure phosphoric acid. Combined with prior precipitation of anionic impurities, this process, states the report, quantitatively frees wet-method phosphoric from cationic contaminants.

• No. 96,000, Siemens & Halske A. G. (Berlin and Munich), which concerns a process of producing high-purity germanium or silicon halides. According to the report, silicon or germanium tetrabromide can be purified well enough by this process to serve as starting materials for the corresponding rectifiers and transistors.

• No. 96,006, I. G. Farben (Ludwigshafen), which outlines a process of preparing hydroxylamine from sodium nitrite and sodium bisulfite. Detailed study of such factors as molar ratios, temperature, concentration, pH, gassing rate and cooling requirements, states the report, resulted in increased yields.

• No. R 703, R 704 (studies taken from different Russian technical journals), which cover, respectively, new calcium and sodium orthosilicates, and the effect of heat treatment on the catalytic properties of silica gel.

• No. 95,783, I. G. Farben (Ludwigshafen), which describes a process of enrichment of cobalt-containing raw materials. According to the patent application, cobalt content of materials containing iron, copper and/or nickel can be increased by the described reduction process.

• No. 96,003, Farbwerke Hoechst (Frankfurt and Hoechst), which covers a process of producing calcium-ammonium nitrate. Addition of the specified substance to fused ammonium nitrate prior to introduction of ground limestone minimizes or prevents evolution of gases in the melt and formation of calcium nitrate, relates the report.

• No. 96,001, I. G. Farbenindustrie A.G. (Ludwigshafen), which relates to a process of preparing iron-free alumina by pressure hydrolysis of basic aluminum salts. According to the report, iron-free alumina can be precipitated from basic ferriferous aluminum chloride solutions by heating in an autoclave. Alumina thus obtained, it continues, is free of iron, even when the basic salt solution has a high iron content.

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PRODUCTION . . . .

EQUIPMENT

Small Potentiometer: A potentiometer, only 0.5 in. in diameter and about 1.5 in. long, is the latest offering by Ace Electronics Assn. (Somerville, Mass.). Dubbed Sub-miniature Precision Wire Wound Potentiometer, the unit is said to have all the characteristics and refinements found in the larger devices, and to be suitable for the miniaturization of controls in the process industries.

•

Fire Container: Following designs specified by the National Board of Underwriters and the National Fire Protection Assn., The Protectoseal Co. (Chicago) is fabricating storage cabinets for flammable liquids. They're made of steel, have a capacity of 45 gal., and are designed to provide safe storage of the liquids within actual work areas.

•

In Brief: Bulletin 1603, issued by Nelson Electric Manufacturing Co. (Tulsa, Okla.), describes a hermetically sealed electric heater that obtains temperatures to 500 F in open air, tolerates temperatures to 1000 F when immersed in oxygen-free liquids.

• Bulletin 541, compiled by Industrial Engineering Corp. (Louisville, Ky.), covers the company's new line of basic test equipment (for analysis of hydraulic-pneumatic flow rates, regulation of controls) and Gage Gards for the protection of sensitive pressure instruments.

• Bulletin 6-10, published by The Foxboro Co. (Foxboro, Mass.), details a new group of pressure-measuring elements for industrial instruments. Included is an application chart on "How to Select the Measuring Element."

•

Variable Columns: An easily disassembled glass-to-glass coupling and removable filter discs, says manufacturer Fischer & Porter Co. (Hatboro, Pa.), permit length of its Ultramax ion exchange column to be varied at will. The unit, also usable as a chromatographic column, features the Ultramax valve, which, declares F&P, requires no lubricant, permits fine effluent control.

•

Fast Filler: Up to 3,600 small (1 cc. to 30 cc.) containers can be filled in an hour with its new Vialfil model RF-2, claims Popper & Sons (New York). The filler will handle oils, solutions and suspensions.

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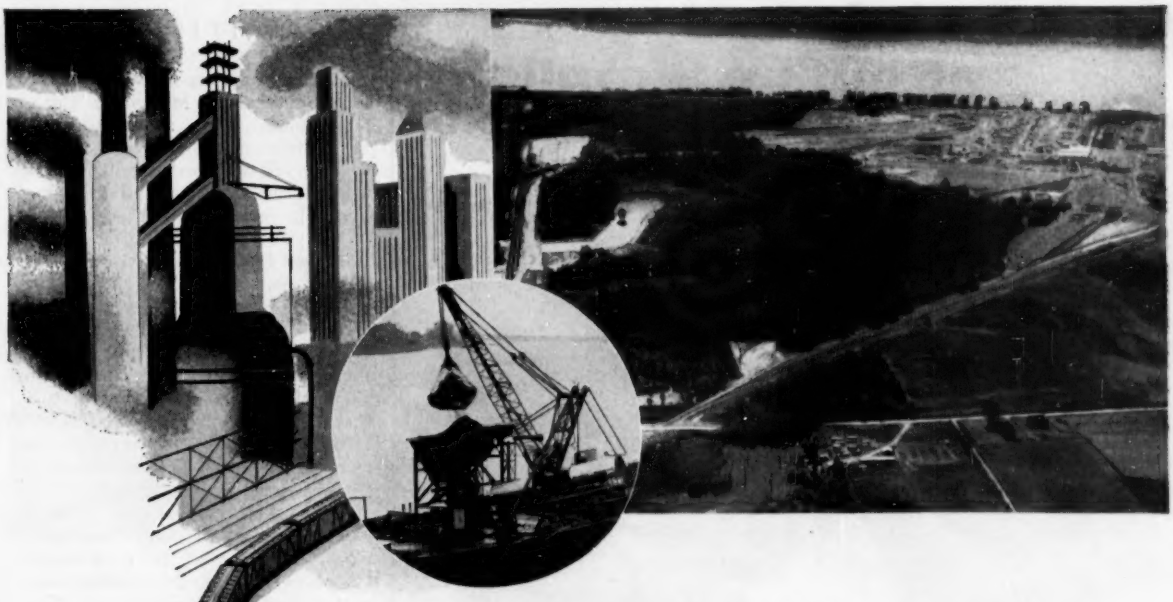
4-Way Valves: Control valves with only one moving part (a one-piece



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Such locations are somewhat hard to find, but the Chicago & Eastern Illinois Railroad has two excellent sites that are flood-free even when water is highest. And, the C&EI has river terminals now in operation.

Economic studies available — two books giving factual information about the characteristics and facilities of this area. To secure copies without obligation, simply write to D. T. Sheehy, Director of Development — Chicago Eastern Railroad, 332 South Michigan Avenue, Chicago 4, Illinois.

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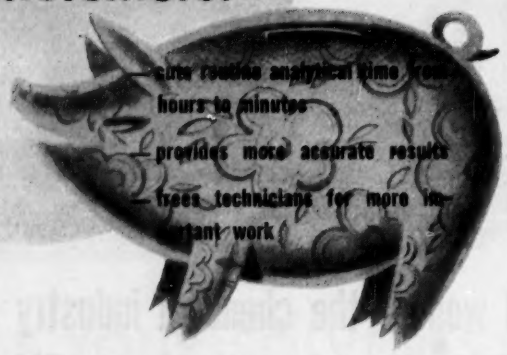
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PRODUCTION. . . . .

spool, which carries the seals) are now in production at Modernair Corp.'s San Leandro, Calif., works. Adaptable to subbase, manifold, panel, console or conventional piped installations, the 4-way units are designed for air or hydraulic service to 200 psi.

•

Improved Extinguishers: Walter Kidde & Co., Inc. (Belleville, N.J.) declares it has improved its electrically operated, automatic carbon dioxide fire extinguishing systems by providing for total enclosure of all operating parts, simple visual inspection to determine that the system has operated, and a testing procedure that permits actual check of all operating functions except actual discharge of cylinders.

•

Foam Notes: Elastomer Chemical Corp. has licensed B. F. Goodrich Chemical Co. to do development work with Elastomer's continuous foam vinyl process. As it works now: inert gas is dissolved under pressure in a vinyl plastisol; the foamed plastisol is then sprayed into a mold or onto a casting surface and fused to form the finished product.

• Regardless of adverse climatic or other conditions, claims MMM, Inc. (Houston), its Styrofoam pipe insulation Vapo-Wall meets all insulation requirements, covers the same temperature range for every size of pipe from ¼ in. to 36 in.

•

Simplified Control: All regulation has been consolidated into "one-knob" control on the TSA-21 process timer in production at General Electric's Schenectady, N.Y., works. The unit, which simultaneously controls the timed closing of one electric circuit with the timed opening of another, is suggested for use on molding presses and machining tools, and in automatic mixing operations.

•

Standard and Cheaper: As of the first of this month, Pfaudler made its special acid-alkali-resistant glass a "standard" item on its glass-lined equipment, thus eliminated the 10% premium charge for it. The special glass was introduced by Pfaudler at the Exposition of Chemical Industries three years ago (*CW, Nov. 24, '51, p. 47*).

•

Remote Indicator: Miniature remote indicators featuring 5-in. readable scales are being supplied by the Hays Corp. (Michigan City, Ind.) for the measurement of functions such as pressure, draft, flow, level, or temperature. The indicators are available as either electric or pneumatic receivers, feature internal illumination and flush or semiflush panel mountings.

AN "F"

is the shortest distance to her hand!

A Continental "F" style can is the shortest distance to the shopper's hand. In the store it says, "Buy me!" In the home it says, "Use me!"

Put these beautifully lithographed containers to work for you. Our Tailor-Made Package Service brings on-the-nose deliveries when and where you say. It means intelligent discussion of your individual problems, and as much or as little of our research and engineering as you require to lick them. Why not call Continental today.

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now you can › GIVE YOUR SALES FORCE THE FINEST COMPETITIVE RIGID VINYL SHEET

Superior Products of Varied Sizes and Shapes Can Be Vacuum Formed from Rigid Vinyl Sheets Made from EXON 450! In end products as above, get excellent dimensional stability, needle sharp clarity of minute details. These exceptional characteristics are due to the unusual properties of the base resin used—EXON 450.

The finest rigid vinyl sheets can now be processed with unusual economy. *One* resin—EXON 450—instead of *two*, can be formulated to meet ASTM D708 44T (Grade 1). Fabricators of vacuum formed products report excellent results using rigid sheets processed from EXON 450. This superior resin has many outstanding properties.

EXON 450

- maintains excellent color and clarity
- may be easily formed
- has excellent electrical properties
- does not support combustion
- takes a high surface finish
- has fine dimensional stability

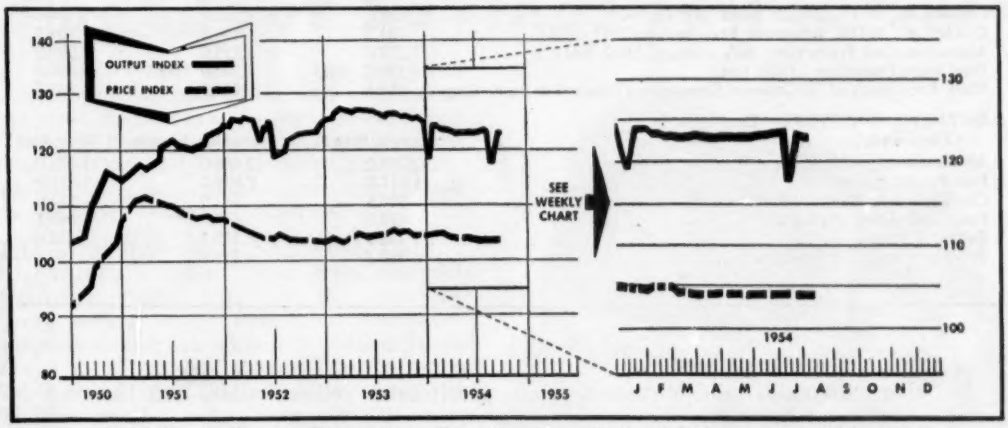
More and more, industry looks to Firestone for specific resins for specific needs. EXON 450 is one example. Whatever *your* problem, look for the answer in the ever-expanding line of versatile Firestone EXON resins.

EXON

For complete information or consultation on any processing problem... call or write

CHEMICAL SALES DIVISION

Firestone Plastics Co., Dept. 4E, Pottstown, Pa.
Division of the Firestone Tire & Rubber Co.



CW Index of Chemical Output—Basis: Total Man Hours Worked in Selected Chemical Industries
CW Price Index—Basis: Weekly Prices of Sixteen Selected Chemicals

MARKET LETTER

A strong, postsummer price-changing wind continues to blow through the nation's chemical marketplaces.

Pointing this up—though somewhat belatedly being pressured by higher caustic soda tags of a couple of months ago (CW Market Letter, June 26)—are last week's boosts on sodium metasilicate and sesquisilicate. These, of course, follow the earlier advances on some caustic cleaning and bottle-washing compounds.

All the newer prices (10¢ to 15¢/cwt. higher), go into effect immediately to spot buyers, Oct. 1 to contract customers. The rundown: anhydrous metasilicate will cost $5.10/cwt. (bags, c.l., works); pentahydrate granular up to $4.10; hydrated sesqui, $4.60.

•

Solid caustic soda itself, though maintaining a fairly firm front on the domestic market, is still trotting along at a reduced rate in the export field. There's no obvious indication, however, that producers' export prices will soon tumble from the current steady $3.25/cwt. (less 5% discount) level. This despite reports that resellers are making some material available at $3—and lower—f.a.s.

•

Competitive forces are still hefty factors in lowering prices. Rapidly heading for fulfillment are the indications here (CW Market Letter, Sept. 4) that most plasticizer customers will be paying near outside-deal prices on an official basis. Barrett last week emulated Ohio-Apex's move in reducing schedules on dioctyl phthalate (DOP) and diisooctyl phthalate (DIOP), down to a hoped-for market-stabilizing 30½¢/lb.

Dicapryl phthalate, too, as was predicted, is now officially down ½¢/lb. New quote: 29½¢. That halves the traditional 2¢/lb. differential between dicap and DOP, DIOP.

•

Pushed up are a fistful of mercury derivatives. Hikes, ranging from 10¢ to 55¢/lb., are laid to the cloud-tickling prices still prevailing on the metal. Major and minor mercurials affected include calomel, corro-

MARKET LETTER

WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
CHEMICAL WEEK Output Index (1947=100)	123.1	123.0	126.2
CHEMICAL WEEK Wholesale Price Index (1947=100)	104.2	104.3	104.9
Bituminous Coal Production (daily average, 1,000 tons)	1,275.0	1,235.0	1,599.0
Steel Ingot Production (1,000 tons)	1,580.0 (est.)	1,502.0 (act.)	2,060.0
Stock Price Index of 13 Chemical Companies (Standard & Poor's Corp.)	318.8	314.6	245.7

MONTHLY INDICATORS—Employment (Thousands)	Latest Month	Preceding Month	Year Ago
All Manufacturing	12,259.0	12,484.0	13,656.0
Non-durable Goods	5,317.0	5,304.0	5,618.0
Chemicals and Allied Products	511.5	517.9	510.6
Paper and Allied Products	428.9	435.7	443.1
Rubber Products	166.9	199.1	213.6
Petroleum and Coal Products	180.6	179.8	190.6

sive sublimate, mild ointment, white precipitate, yellow iodide, and the oxides, red and yellow.

Quicksilver demand has been somewhat off of late, but trade talk has it that sellers are holding back offerings in the hope that prices will go even higher. Some lots are reported selling at close to a fantastic $310/flask (76 lbs.)—almost $90 above the government's $225 buying peg (CW, July 31, p. 67).

You can still get odds that when the overdue plummet comes, it'll be explosive.

•

Speaking of explosives, an Atlas Powder report, out last week, indicates that 791 million lbs. were marketed last year. That's two-thirds above the World War II level, more than double the 1935-39 prewar average.

Atlas's president, Ralph Gottshall, also points out a significant end use pattern switch for explosives, at the same time envisions a well-maintained demand by newer, expanding outlets. From a peak in the mid-'40s, when coal-mining usage consumed almost half the total explosives sold, that one-time largest single siphoner has declined to where it now accounts for less than a third.

The drop, however, has been more than offset by stepped-up demands for explosives in metal and nonmetal mining, quarrying and construction. The latter (superhighways, dams, bridges, public and private projects, etc.) has been particularly booming.

•

Major resin makers this week are just about unanimous—for the moment, at least—on newly posted epoxy schedules. Ciba, following Shell Chemical and Bakelite reductions (CW Market Letter, Sept. 11), now lists its CN-502 and -503 grades at 90½¢/lb. (drums, c. l. and truckload).

Ciba had been contemplating just such a move, but for sometime in the future. Reason: Larger batch production and standardization of a specific range of epoxies. Current action by the "big boys", however, probably spurred Ciba's announcement.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending Sept. 13, 1954

UP

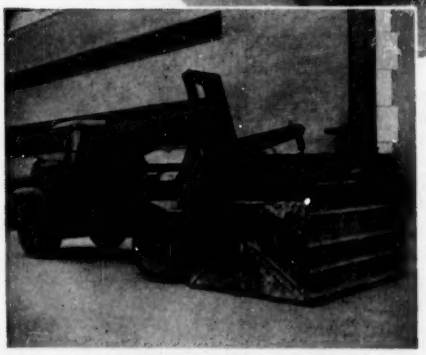
	Change	New Price		Change	New Price
Litharge, com'l powd., bbls., c.l., works, frt. equald.	$ .0025	$ .16	Mercuric cyanide, NF VIII, powd., fib. dms.	$ .50	6.84
Mercuric chloride, NF, cryst., dms., 50-lb. lots or more	.40	4.98	Mercuric iodide, red, NF, fib. dms.	.45	7.72

All prices per pound unless quantity is stated.

You Can't Read This Ad Without Visualizing Tremendous Savings in Your Plant

If the handling of bulk materials is required in your plant, be they raw, finished, moist, liquid or rubbish materials, read these simple facts about the Dempster-Dumpster System. Then, visualize its application and tremendous savings possibilities in your own operation.

VISUALIZE HAVING ONLY ONE TRUCK with scores of bodies. One truck-mounted Dempster-Dumpster with only one man, the driver, serving many detachable Dempster-Dumpster Containers. These containers range from 2 to 21 cu. yds. capacity for use with recommended type Dempster-Dumpsters, and each container built to suit the materials to be handled—be they solids, liquids, dust, bulky, light or heavy. You place a container at convenient materials accumulation points, in or out of plant. As each is loaded, it is picked up, hauled and dumped, or the load is set down intact, and the entire operation is handled by hydraulic controls in cab by only one man, the driver.



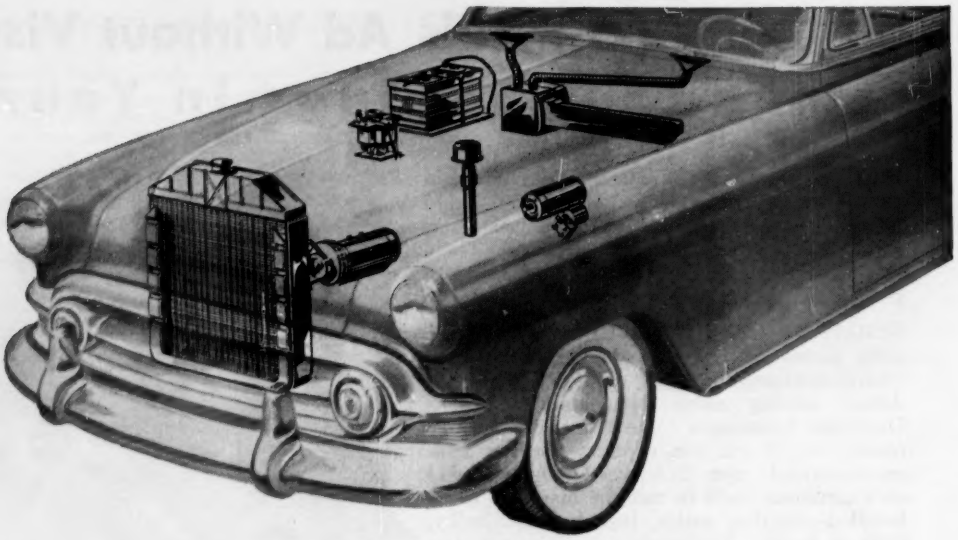
The photographs above were made in the plant of one of the nation's leading brands of soaps and dentifrices. This installation comprises a single Dempster-Dumpster and 49 containers. Photos illustrate the simple one man pick up, hauling and dumping operation of a drop bottom container.

THE NATION'S LEADING FIRMS USE THIS SYSTEM BECAUSE OF ITS AMAZING EFFICIENCY AND TREMENDOUS SAVINGS.

YOU ELIMINATE trucks standing idle . . . eliminate re-handling of materials . . . eliminate loading crews. You increase efficiency, sanitation and good plant-keeping with this amazing Dempster-Dumpster System—the lowest cost method of bulk materials handling ever devised. Write us now for complete information. Manufactured and sold exclusively by Dempster Brothers, Inc.

One Truck-Mounted Dempster-Dumpster Handles Scores of Containers... All Designs... All Sizes

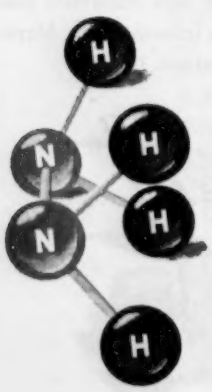
DEMPSTER BROTHERS, 294 Dempster Bldg., Knoxville 17, Tenn.



from Hydrazine, *improved soldering fluxes*

A remarkable new series of soldering fluxes has been developed by McCord Corporation, that makes possible greater economy and efficiency in production of soldered components. Based on compounds of hydrazine, these fluxes, called CORONIL, are non-corrosive and can be used without hazard. They remove oxides and other films from most of the commercially used metals such as copper and brass—as well as others—to permit more effective work and fewer rejects. Currently, these hydrazine-based soldering fluxes are being successfully applied in the manufacture of automotive radiators and other heat exchangers, parts for the electrical and electronic industries, carburetor floats, oil strainers, and various other products where effective non-corrosive soldering is essential.

from Hydrazine, *new fields for chemical research*



Every day, more and more interesting new applications of hydrazine are being developed. In addition to its use in fluxes, hydrazine is an important component of plant growth regulators, and an effective scavenger of oxygen from boiler feed water. As a chemical capable of reacting with a wide variety of both inorganic and organic materials, hydrazine is the starting point for countless hydronitrogen compounds. Perhaps you would like the latest information on hydrazine and its derivatives and how they might apply to your field of interest . . . if so, why not write today?

OLIN MATHIESON CHEMICAL CORPORATION
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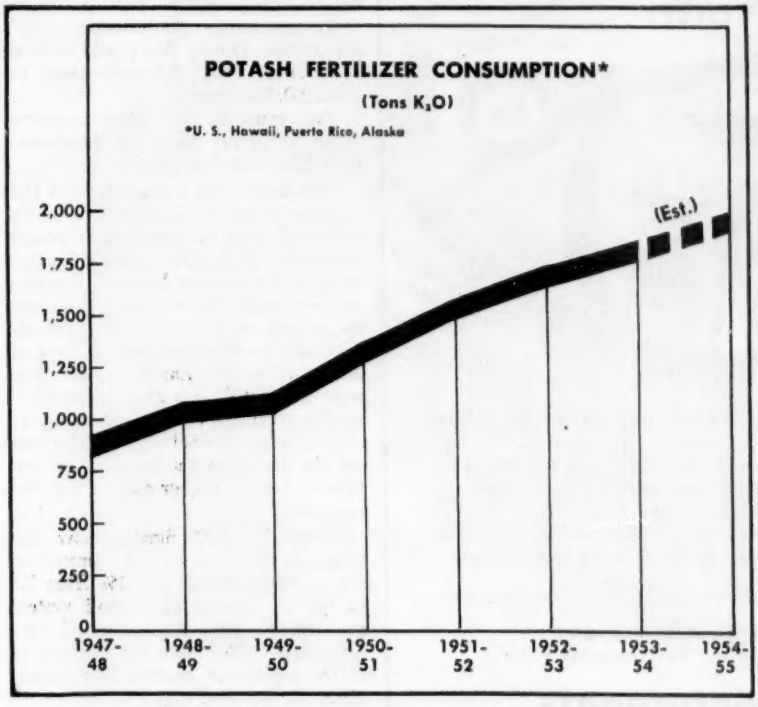

POTASH USE: No zoom, but a satisfactory climb.

Double Tally for Potash

American Potash Institute is out this week with its rundown of potash deliveries during the fertilizer year June '53 through May '54.

Much of the institute's data will be incorporated in the U. S. Agriculture Dept's upcoming report—*The Fertilizer Situation for 1954-55*, which is now being compiled by its Commodity Stabilization Service.* Now nearing completion and slated to come out by the end of this month, the latest in a series of reports on fertilizers issued by USDA agencies covers preliminary forecasts on plant nutrients (nitrogen, phosphates, potash).

Trend to More: Perusal of the institute's latest potash dope sheet points to one clear conclusion: more and more farmers are apparently heeding the oft-repeated urgings by various fertilizer associations and some government agencies to use more fertilizers.

Although deliveries do not necessarily correspond to consumption, the figures are generally close enough to indicate a trend one way or another. And the report shows that potash deliveries for agricultural purposes are mounting. In continental U.S. alone they amounted to more than 1,791,000 tons of potassium oxide (K_2O) content—a better than 3% increase over last year. That, of course, comes nowhere near '52-53's substantial 13% jump over the previous fertilizer year, but does maintain the satisfactory climb characterizing the past several years (*see chart*).

Potash deliveries in North America as a whole notched up a similar 3% rise—to pass for the first time the 2-million-ton mark. The year's total: 2,006,300 tons. But while American producers' shipments were well over any previous year, those of imported potash—about 148,000 tons—are some 29,000 tons below '52-'53's 177,000.

Exports, Down—Up: Some foreign customers received less U.S. material. Out-of-country shipments for the recently ended season include 72,348 tons to Canada, off a slight 1%; and about 18,850 tons to Hawaii, a decrease of not quite 3%.

On the other hand, Cuba this year rejoined the ranks of those taking more potash. Deliveries there jumped 45%, amounting to nearly 6,670 tons. Last season the island country re-

* CSS has taken over, to some extent, duties of the former Production and Marketing Administration.

New starter for anti-oxidants: fatty alcohols

In the race—

Newly-developed anti-oxidants are an example of the remarkable capabilities of fatty alcohols. And when chem-men look into these long-chain aliphatic chemicals, their first choice is often CACHALOT brand.

For CACHALOT *alcohols are vacuum-distilled to close specifications: they work as well on production runs in your factory as they do in laboratory tests. You can specify the exact product to meet your needs from this large line of cetyl, oleyl, stearyl alcohols and mixtures—NF, USP, technical grades.*

Want to find out more? For the booklet on "Possibilities", write **M. Michel and Company, Inc.,** 90 Broad Street, New York 4, N. Y. Over a quarter century a basic supplier to chemical manufacturers, their trade name for these finer fatty alcohols is

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Chemically pure Manganese Carbonate ($MnCO_3$) in commercial tonnages is now available at a lower price than ever. Commercial quantities of Manganese Dioxide (MnO_2), in addition, are also available. It may pay you to investigate Minnesota Manganese for *your* production process. Its uses are many and varied—chemicals, pharmaceuticals, feeds, fertilizers, ceramics, metallurgy, paints, textiles, rubber products, and many others.

Purity: 100% soluble in acids
Grades: Technical
Packing: Carbonate—100# bags
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LOOK TO **metso®** **anhydrous...**
FOR FULL **SiO_2** BENEFIT

Metso Anhydrous is the "anhydrous" with the true metasilicate ratio. It is high in silica (SiO_2)—low in CO_2 impurity. The balanced properties of alkali and soluble silica, long recognized for superior performance in hydrated metasilicate are sure when you choose Metso Anhydrous, Sodium Metasilicate.

You get more also because Metso Anhydrous' sizing is controlled to minimize dusting, and solubility is fast and complete.

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PQ® SOLUBLE SILICATES

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MARKETS . . . . . .

ceived some 4,600 tons—a drastic 74% cut under the previous year's shipments. Puerto Rico, too, took an increase of 26%; deliveries there totaled 20,853 tons.

Deliveries to all other countries came to 3,681 tons, an impressive 60% hike over last year's.

Still Tops: API further reports that muriate of potash continues to be the principal type of agricultural potash delivered. The 60%- and 50%-grade muriate figures are lumped, together comprise 93% of the total. Sulphate of potash and sulphate of potash-magnesia are also grouped, making up nearly all of the remaining 7%. Manure salts, still on a skid, dropped to an insignificant figure, indicating an almost complete reliance by farmers on the use of more concentrated fertilizers despite higher cost of the concentrated.

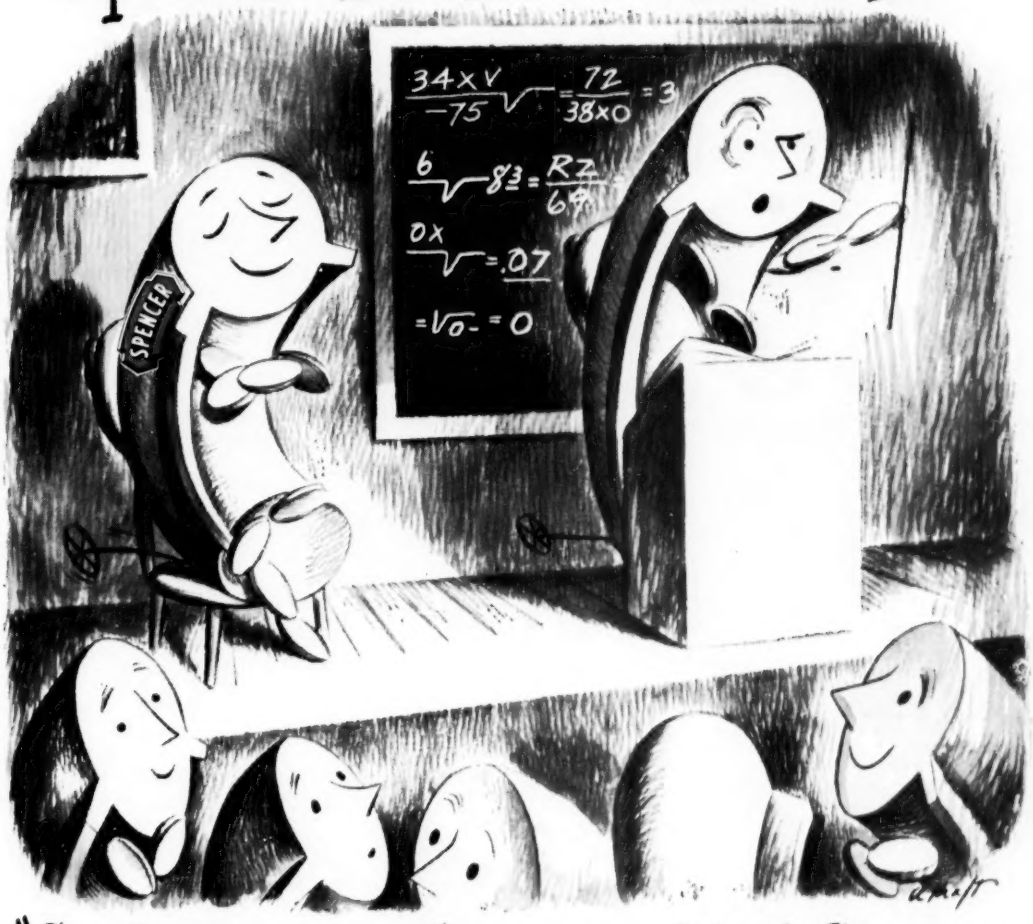
(Official USDA figures show that although the cost/ton of commercial fertilizers increased by 51% from '35 to '53, the average plant food content per ton has also been stepped up—by nearly 35%. Thus the increase of active ingredient content has largely offset the boosted tags.)

Not entirely unexpected was the approximate 6% drop-off from '52-53's deliveries of potash for chemical uses. The new figure: 92,487 tons of K_2O, with 60%-muriate grade accounting for 94-95% of that total, and sulphate of potash the balance.

On Target: Back in 1951, USDA estimated fertilizer requirements for the 1955 growing season. Potash need, said the department, would tally out to some 2,185,000 tons, which included import-export quantities. The following year (July, '52) the Defense Production Administration set up an actual production goal —2 million tons by July 1, '54. Though pinpoint-accurate data are not available, a government source close to the scene reports that the output goal was very nearly hit last year. With the additional installations in since then, it's beyond question that U.S. capacity is now ample to produce well above the target.

Current consumption, of course, is bouncing along at a somewhat slower rate than that at which potash can be produced in this country. Fact is, a good "guesstimate" is that total deliveries (domestic and to U.S. possessions) during the new 1954-55 fertilizer year will level at about 2 million tons. Thus, the production capacity here together with imports, which may total 110,000-120,000 tons, is sufficient to meet all foreseeable potash demands.

Spencer Service is Wonderful



"Gentlemen, according to my latest discovery ...nothing is faster than Spencer Service!"

You'll be meeting Poly-Eth, new symbol of Spencer Polyethylene, on the pages of TIME magazine regularly. This advertisement is the first of a series, and appeared in the September 13 issue. Purpose of these ads is to acquaint the general public with the unusual properties of polyethylene; increase the demand for this unique plastic.

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America's Growing Name In Chemicals

SPENCER PRODUCTS: "Mr. N" Ammonium Nitrate Fertilizer • SPENSOL (Spencer Nitrogen Solutions) • Ammonia (Commercial and Refrigeration Grade) Aqua Ammonia • 83% Ammonium Nitrate Solution • Synthetic Methanol Formaldehyde • Hexamine • Polyethylene (1955) • FREZALL (Spencer Dry Ice) • Cylinder Ammonia

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Mile Rock Light guards the south side of the channel leading through the Golden Gate into San Francisco Bay, one of the world's finest land-locked harbors. The lighthouse, built on top of Mile Rock, is constructed of steel and concrete upon a massive monolithic concrete base 34 feet high. The top of the beacon is 90 feet above mean low water. On the opposite side of the Golden Gate is Point Bonita Light.

Something to steer by for users of electrochemicals are the standards of quality and service set by Niagara Alkali Company. Many leading manufacturers depend, with the confidence of long experience, upon Nialk® Liquid Chlorine, Nialk Caustic Potash, Nialk Carbonate of Potash, Nialk Paradichlorobenzene, Nialk Caustic Soda, Nialk TRICHLORethylene, Niagathal® (Tetrachloro Phthalic Anhydride)

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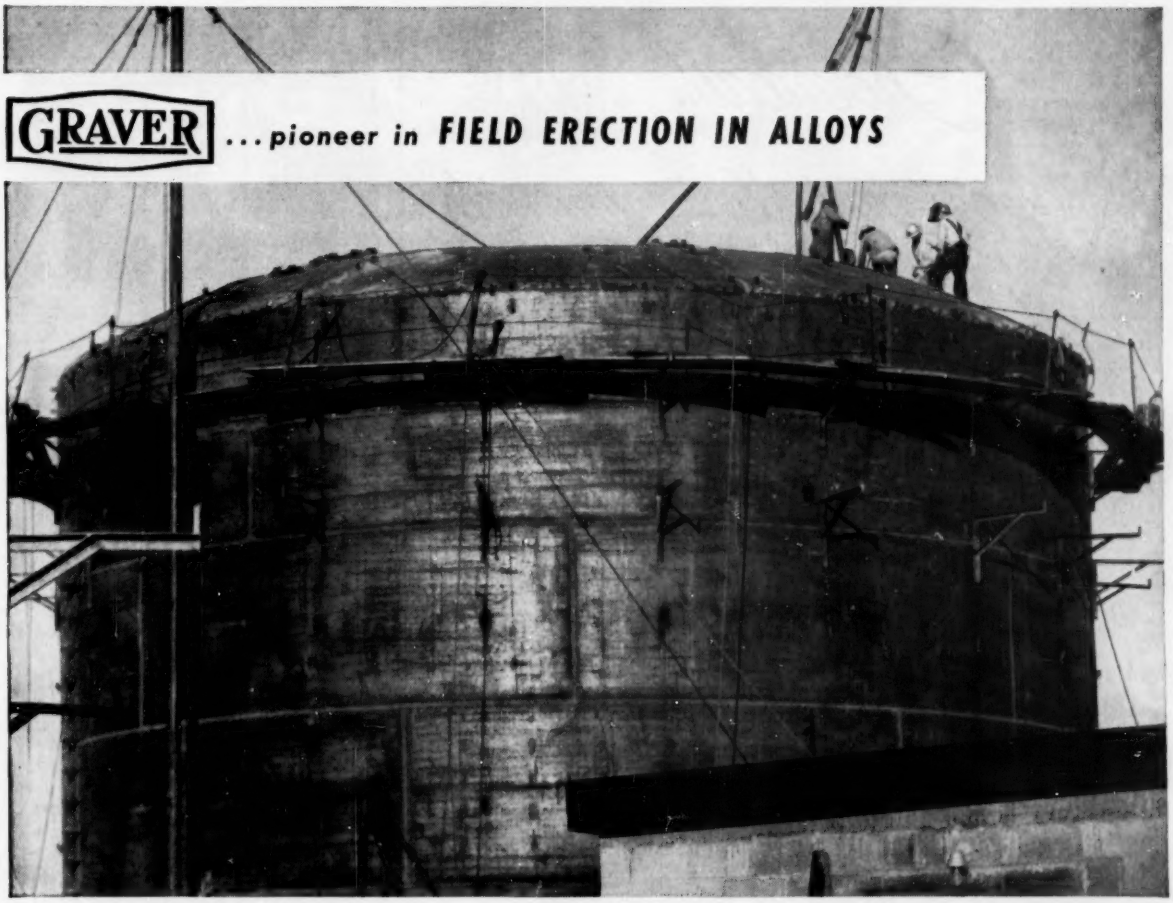

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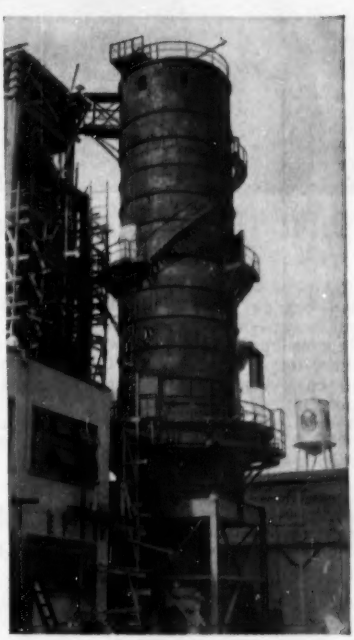
Consider the wealth of experience Graver has gained in field erection in alloys . . . experience that dates from the birth of alloys. It is standard procedure for Graver to build large, site-erected tanks, towers and process vessels of every size and description—like the large nickel-clad tank for storing caustic shown above, and the intricate spray tower on the right.

Both in this country and abroad, Graver has acquired a reputation for fine craftsmanship, plus a unique ability to more than satisfy customer demands.

For all industries—chemical, petroleum, food, pharmaceutical—Graver fabricates in nickel, stainless, clads and aluminum, as well as in carbon steels. Precision work, painstaking care, intensive inspection methods—these are integral parts of the Graver method. Taken together, they mark Graver as a source worthy of your consideration.



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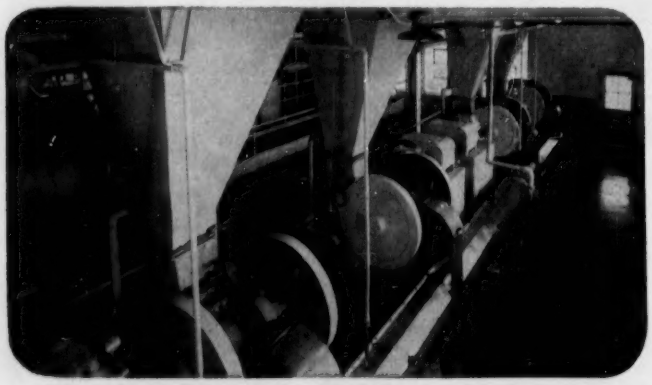

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Unlimited capacities are no problem if your plant has an installation of "DAVENPORT" Continuous Presses in multiple units.

If your application requires a single or a battery of units, "DAVENPORT" engineers will be pleased to help you with the arrangement.

Send for our illustrated catalog. For quick reference, see the Chemical Engineering Catalog, 1953 or '54.

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De-Watering Presses and Screens

ROTARY Steam Tube, Hot Air and Direct Fire Dryers

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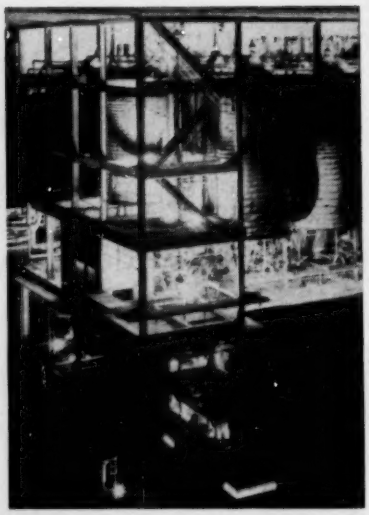

STEEPHOUSE TANKS: A 75 million lbs./year chemical raw material source.

Corn Water Chemicals

Showing more than a modicum of interest in penicillin's uptilting output curve this week are most of the nation's corn refiners. For penicillin currently consumes the bulk of the corn industry's once-waste product, steepwater* concentrate.

Penicillin hasn't yet hit the million lb./year level of production, but latest estimates peg output at close to the three-quarter mark, some 750,000 lbs. That's a small increase over last year's probable 740,000 lbs., but an impressive jump from 1950's 429,000 lbs. of total penicillin salt.

Though no accurate consumption data are available, it's a good guess that penicillin makers use as a mould feed the bulk of the near-75 million lbs. of corn-steep liquor. Yeast culture, inositol, and other chemicals blot up the balance of the commercially concentrated (52% solids) liquor.

The penicillin industry's market bid for the corn-steep process water came about dramatically as a wartime expedient, by now has become a firm economic relationship. Up to 1942—with battlefield demand for penicillin at its peak—mould growers were hamstrung by the low yields on all the mould nutrients then being used.

Along about that time the Northern Regional Research Laboratory, Peoria, Ill., stumbled on the fact that steepwater added to the culture media had a remarkable effect: the change in menu boosted the penicillin yield from

* Water in which corn kernels are soaked before further processing. The cloudiness, familiar to homemakers when corn on the cob is cooked, contains roughly 45% proteins, 22% phytates (and other salts), and 30% carbohydrates or their breakdown products.

Dependable Source for Chemical Raw Materials

Harold R. Nelson, President, Michigan Bleach Corp., Detroit, Mich.

"We're building our bleach business on quality ingredients"

— Harold R. Nelson, President, Michigan Bleach Corp.

"We are one of the largest producers of concentrated sodium hypochlorite bleach in this area," says Harold R. Nelson, President, Michigan Bleach Corp., Detroit, Mich. "Our product is used principally for treating waste, bleaching of textiles, and some home bleach.

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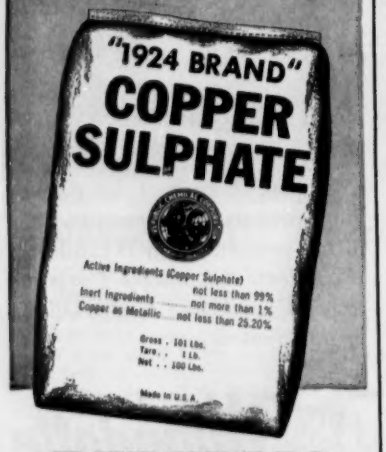
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Since then, of course, new mould strains and other developments have further stepped up the drug's production.

Method of tapping the chemical raw material is not complicated. Refiners pour carloads of cleaned shelled corn into high wooden tanks, which hold somewhere between 2,000 and 2,500 bu. The tanks (*see cut*) are fitted with cone-shaped iron bottoms.

The corn is then soaked for 36-48 hours in circulating warm water containing a little ferment-retarding sulfur dioxide. This steeping loosens the hulls, affords easier separation of the parts of the kernel.

First by-product of the corn refining industry, the steepwater comes from the steeptanks with about 7% solids. The liquor is then concentrated in vacuum tanks to a heavy consistency. The commercial grade, the form sold to penicillin manufacturers, finally comes out with 52% solids.

One puzzler attending the use of the corn liquor, however, still remains unsolved: Why does corn from various sections of the country, from different areas of the state, or even from the same patch of cornfield, affect the penicillin yield in a statistically significant manner?

Chemical Offspring: Of the innumerable compounds that may be derived from the unique chemical source, only a few of the steepwater products besides penicillin seem, on the basis of cost of production, to have market possibilities. Phytin (the hexaphosphoric acid ester of inositol), while found in most cereals, can be removed from the steepwater as the calcium salt by the

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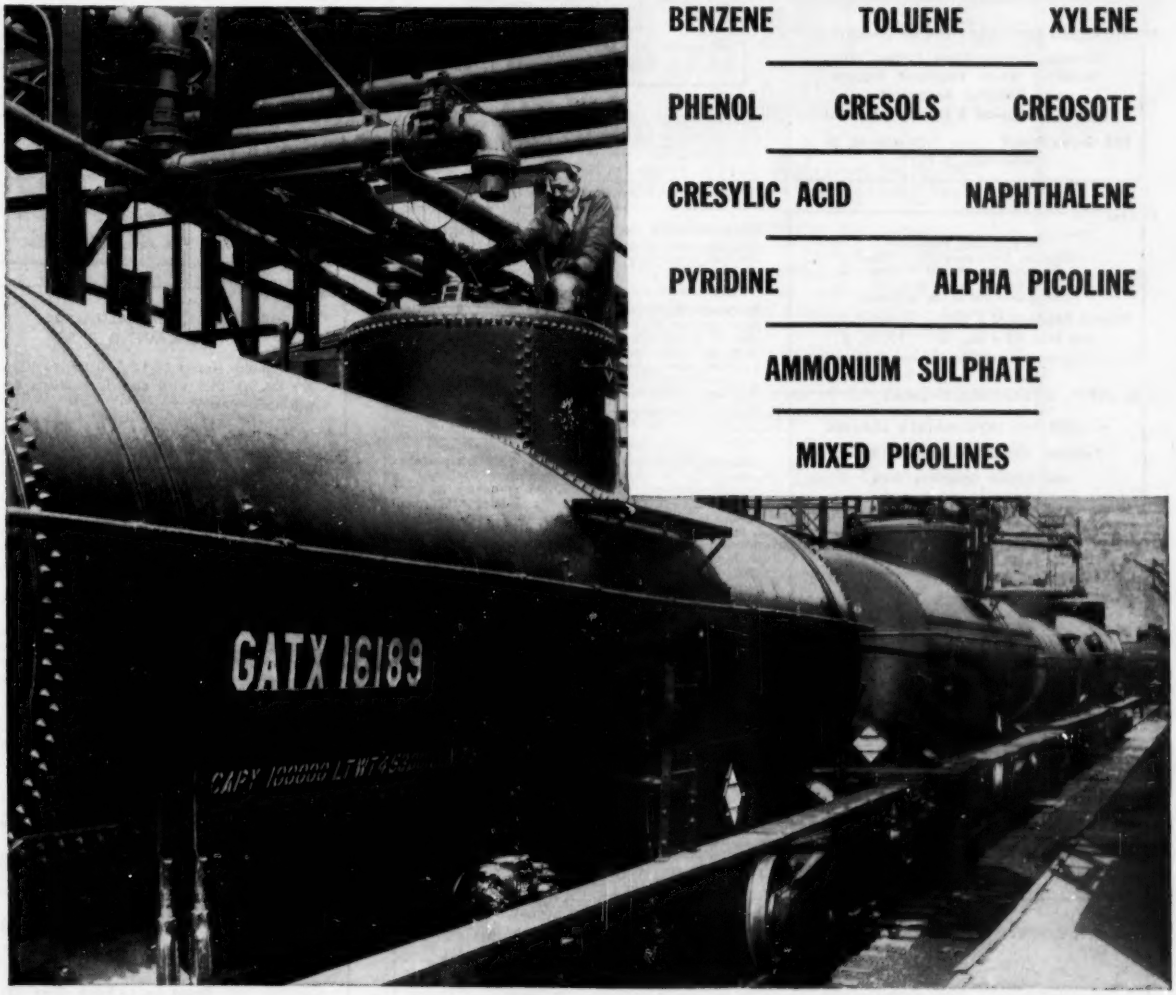

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addition of lime. Some 1 million lbs. of calcium phytate are currently U.S.-produced.

The hydrolysis of calcium phytate yields one marketable product, inositol. Its a ring-form carbohydrate and a member of the vitamin B complex. Price tag on the material is about $5/lb. Though not yet a heavy-tonnage product, it has been used experimentally for several years on patients with hardening of the arteries, peripheral vascular disease, coronary artery disease and fat-induced liver abnormalities.

On the other hand, it's doubtful if sodium phytate can compete at all for a place among commercial sequestering agents unless the price can be pinned in a 25-30¢ range.

At the present time the great bulk of the steepwater is not concentrated for chemical utilization. The wet-process corn refiner has, in general, three by-products that he wants to market: gluten meal (containing 41% protein), which is a premium product; corn hull fiber (from the grinding of fibrous corn cake after the oil is taken from the germ); and steepwater.

Years ago steepwater was discarded,

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or at best, was dried with the feed to 10-12% water content and sold in the neighborhood of the steeptanks. Now it is regular practice to add nearly all of the steepwater to the corn hulls or bran. This mixture is dried still further, mixed with gluten meal to become corn gluten feed (containing 21% protein). In this dried form the marketing area is greatly expanded over that available to the old-fashioned wet mash.

The corn refiner doesn't sell his gluten feed and meal directly to the farmer. Just about all of the corn refiners' tremendous output of feeds (about 1 million tons/year) goes to the mixed feed industry. The feed mixers make complete rations, delivered in bags, ready for the animals to eat.

At the present time practically all gluten feed contains steepwater. The feed accounts for about 75% of the government's combined totals on gluten feed and meal. An estimate, then, of the "captive" market for steepwater can be scaled to these government output figures: 930,000 tons of gluten feed and meal in '53 (preliminary), compared with 872,000 tons in '52, 961,000 tons in '51.

The wet-process corn refiner watches the relative demands for the gluten meal, thus is able to judge what steepwater in concentrated form he is going to have available to antibiotics makers.

Gauge for total availability of steepwater is the wet-process corn grindings output. The rule of thumb is usually 3½ lbs. soluble material/bushel corn (dry basis).

A glance at the annual turnout data indicates a fairly steady production level:

Wet Process Corn Grindings
(1,000 bu.)

1949	116,174
1950	131,439
1951	129,049
1952	126,128
1953 (prelim.)	130,345

On a basis of an average annual figure of 125 million bu., there's a potential supply of about 425 million lbs. of steepwater (dry basis). Compare that with the current 75 million lbs. of annual sales of the concentrated liquor, which tots up to about 39 million lbs. dry.

If nothing else, the ready availability of the corn-refining by-product should assure a steady source of the concentrate, and perhaps one day a more-than-significant chemical raw material tap.

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Sodium Sulfate
Sodium Sulfite

For Humectant Action plus...

Powerful Solvent Action
Low Viscosity
Low Freezing Point
Low Cost

Use Carbide's Diethylene Glycol

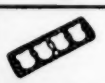
As a hygroscopic agent, diethylene glycol is equivalent to glycerol—and because of its ether linkage, it is generally a better solvent for resins, dyestuffs, and proteins. This solvent power coupled with a low freezing point (–8.0°C.) and low viscosity (35.7 cps. at 20°C.) gives diethylene glycol a range of usefulness that cannot be equalled by other commonly-used humectants. And diethylene glycol gives more humectancy and solvent power for your dollar than any other humectant.

Diethylene glycol is successfully used for:

Gas dehydration

Compounding of GR-S synthetic rubber

Moistening and softening agent for adhesives, cellophane, paper, glues, and gelatin



Resin solvent and softener in composition cork

Humectant and resin solvent in steam-set inks

Humectant for tobacco

Conditioner for textile fibers and yarns

Dyestuff solvent and humectant for printing pastes that will not dry out on storage

Gas reaction inhibitor in casting magnesium and aluminum

You can also use diethylene glycol as a mutual solvent in cutting oils, as an intermediate in the preparation of alkyd resins and fatty acid esters, and as a solvent in the processing of intermediates for cortisone.

Availability: *Diethylene Glycol is available in commercial quantities. For technical help, samples, or prices, call the Carbide office nearest you.*

CARBIDE
AND CARBON
CHEMICALS

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